

Mental Math Questions by Learning Target

Mental Math

Grade 8 Mathematics

A-1

Learning Target	Operations with Whole Numbers (Number Strand: 8.N.1, N.7)
Strategies of Focus	Annexing Zeros

Prior Learning	Answers
1. Multiply: 90×40	3600
2. Divide: $\$14,000 \div 70$	\$200
3. Divide: $25\ 000\ \text{kg} \div 5$	5000 kg
4. Miss Kokum budgets \$450 for her grandson's lunches for the year. How many \$5 lunches can he buy?	90 lunches
5. How many cm are in 4 km?	400 000 cm
6. How many mL in a 4 L jug of milk?	4000 mL
Grade 8 Questions	
For questions 7 to 10, solve and simplify.	
7. $\sqrt{10\ 000} \div \sqrt{100}$	10
8. $\sqrt{10\ 000} \times \sqrt{900}$	3000
9. $\sqrt{200\ 000 \div 500}$	20
10. $6000 \times 1100 + \sqrt{1}$	6 600 001
Other Questions	
11.	
12.	

Mental Math

Grade 8 Mathematics

A-2

Learning Target	Operations with Whole Numbers (Number Strand: 8.N.1, N.7)
Strategies of Focus	Visualization

Prior Learning	Answers
1. What is the volume of a cube that has side lengths of 3 cm?	27 cm ³
2. Which is heavier and by how much? a 36 kg bag of rocks a 100 kg bag of feathers	The feathers are 64 kg heavier.
3. Which is closer to the perimeter of a classroom? 3800 cm 38 000 cm 80 cm 380 000 cm	3800 cm
4. One dog can run 32 km/h. Jerry wants his dogsled to go 96 km/h. How many dogs does he need?	Can't be done. 32 km/h is the maximum speed.
5. A tree is 40 feet tall. There are 12 inches in each foot. How tall is the tree in inches?	480 inches
6. This 40-foot tree needs to be cut into 10-inch logs. How many logs will you get?	48 logs
Grade 8 Questions	
7. If one of the triangles shown here has an area of 18 cm ² , what must be the side length of the square? 	6 cm
8. A square has an area of 36 square units. What is the perimeter?	24 units
9. A cube has sides that are 4 cm long. What is the surface area?	96 cm ²
10. What is the area of the square? 	64 mm ²
Other Questions	
11.	
12.	

Mental Math

Grade 8 Mathematics

A-3

Learning Target	Operations with Whole Numbers (Number Strand: 8.N.1, N.7)
Strategies of Focus	Various

Prior Learning	Answers
1. True or False: $14 = 14 \times 1 + 0$	True
2. True or False: $(9 \times 9) + (9 \times 5) = (9 \times 7) + (9 \times 7)$	True
3. Solve: $42 \text{ cm} \times 1000$	42 000 cm 420 m
4. Solve: $4.2 \text{ L} \times 0.01$	0.042 L 42 mL
5. Solve: $3.49 \text{ kg} \div 1000$	0.00349 kg 3.49 g
6. Solve: $3.49 \text{ kg} \div 0.001 \text{ kg}$	3490 groups no units
Grade 8 Questions	
For questions 7 to 10, simplify and solve.	
7. $\sqrt{64} + \sqrt{144}$	20
8. $\sqrt{1}$	1
9. $\sqrt{10\,000} \times \sqrt{16}$	400
10. $\sqrt{121} - \sqrt{144}$	-1
Other Questions	
11.	
12.	

Mental Math

Grade 8 Mathematics

A-4

Learning Target

Operations with Whole Numbers (Number Strand: 8.N.1, N.7)

Strategies of Focus

Various

Prior Learning

1. Solve: 13×25
2. Solve: 15×7
3. Solve: $98 + 124$
4. List the factors of 9.
5. Solve: $400 \div 20$
6. Solve: $501 \div 3$

Answers

325

105

222

1, 3, 9

20

167

Grade 8 Questions

7. Solve and simplify: $\sqrt{16} + \sqrt{16}$
8. How many unit squares would you need to fill a larger square with a side length of 10 units?
9. Simplify: $\sqrt{36}$
10. Which of the following are perfect squares? 7, 49, or 490

8

100 unit squares

6

49

Other Questions

11.

12.

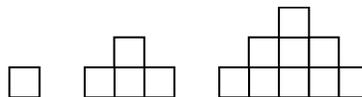
Mental Math

Grade 8 Mathematics

A-5

Learning Target	Operations with Whole Numbers (Number Strand: 8.N.1, N.7)
Strategies of Focus	Various

Prior Learning	Answers
For questions 1 to 5, solve using the operations indicated.	
1. $1 \div 1 \times 1$	1
2. $1 - 1 \div 1$	0
3. $7 \times 8 + 1$	57
4. $8 + 20(4 \times 6)$	488
5. $(488 - 8) \div 24$	20
6. True or False: $12 \times 15 = 6 \times 30$	True
Grade 8 Questions	
For questions 7 to 9, simplify and solve.	
7. $\sqrt{10\,000} \times (22 \times 2)$	4400
8. $\sqrt{64} \times (-0.01)$	-0.08
9. $\sqrt{100} + \sqrt{100} \times \sqrt{100}$	110
10. How many squares are in figure 100?	10 000 squares
Other Questions	
11.	
12.	



Mental Math

Grade 8 Mathematics

A-6

Learning Target Operations with Whole Numbers (Number Strand: 8.N.1, N.7)

Strategies of Focus Various

Prior Learning

1. What are the prime factors of 81?
2. What are the prime factors of 36?
3. What are the factors of 17?
4. What are the first four multiples of twenty-two?
5. What are the first three common multiples of 6 and 4?
6. What are the composite numbers between 10 and 20?

Answers

3

2 and 3

1 and 17

22, 44, 66, 88

12, 24, 36

12, 14, 15,
16, 18

Grade 8 Questions

7. Simplify: $\sqrt{9}$
8. Simplify: $\sqrt{16}$
9. Simplify: $\sqrt{81}$
10. The length of a side of a square piece of paper is $\sqrt{64}$ cm. What is the area of the square?

3

4

9

64 cm²

Other Questions

11.

12.

Mental Math

Grade 8 Mathematics

A-7

Learning Target	Operations with Whole Numbers (Number Strand: 8.N.1, N.7)
Strategies of Focus	Annexing Zeros

Prior Learning	Answers
Solve questions 1 to 6 using the operation indicated.	
1. 24×3000	72 000
2. $1200 \div 20$	60
3. $848\,000 \div 800$	1060
4. 110×6000	660 000
5. $1000 \div 0$	Undefined
6. $0 \div 1000$	0
Grade 8 Questions	
7. Solve and simplify: $\sqrt{49} \times (-10)$	-70
8. Solve and simplify: $0 \times \sqrt{11}$	0
9. Which of the following are true statements? $8 = \sqrt{16}$ $\sqrt{16} = 32$ $\sqrt{16} = 2 + 2$	$\sqrt{16} = 2 + 2$
10. Solve and simplify: $\sqrt{36} + \sqrt{81} + \sqrt{1}$	16
Other Questions	
11.	
12.	

Mental Math

Grade 8 Mathematics

A-8

Learning Target Operations with Whole Numbers (Number Strand: 8.N.1, N.7)

Strategies of Focus Visualization

Prior Learning

Answers

1. Use $<$, $>$, or $=$.
seventeen million seventeen thousand seventy-six _____ 17 170 076
2. Express in standard form:
fifty-four thousand, seven hundred two
3. Express in standard form:
three hundred thirty million, forty-nine thousand, eleven
4. What is the area of a square tabletop with a side length of 40 cm?
5. A \$20 debt is shared equally among five students. How much does each student owe?
6. A shed covers an area of 24 square metres in a 10 m by 10 m green space. What is the size of the green space not covered?

$<$

54 702

330 049 011

1600 cm^2
 0.16 m^2

\$4

76 m^2

Grade 8 Questions

7. How much longer is the side length of a square that has an area of 81 cm^2 than one that has an area of 36 cm^2 ?
8. Solve and simplify: $\sqrt{25} - \sqrt{36}$
9. A square has an area of 100 cm^2 . What is the perimeter?
10. Starting at 1×1 on a multiplication chart, in what direction do the perfect squares all form a straight line?

3 cm

-1

40 cm

Diagonally
downward and to
the right

Other Questions

11.

12.

Mental Math

Grade 8 Mathematics

A-9

Learning Target

Operations with Whole Numbers (Number Strand: 8.N.1, N.7)

Strategies of Focus

Association, Distribution, and Commutative Properties

Prior Learning

Answers

1. Solve: 6000×900

5 400 000

2. Solve: $35 + 46 + 35 + 24 + 4$

144

3. Solve: $24 + 32 + 68 + 26$

150

4. Solve: $81 + 73 + 19 + 68 + 27$

268

5. Express in standard form: $4\,000\,000 + 180\,000 + 756$

4 180 756

6. Express in standard form: $40\,000 + 2000 + 70 + 8$

42 078

Grade 8 Questions

For questions 7 to 10, solve and simplify.

7. $0 \times \sqrt{3600}$

0

8. $\sqrt{36} \times \sqrt{36}$

36

9. $\sqrt{36 \times 36}$

36

10. $-\sqrt{98} \div 2$

-7

Other Questions

11.

12.

Mental Math

Grade 8 Mathematics

A-10

Learning Target Operations with Whole Numbers (Number Strand: 8.N.1, N.7)

Strategies of Focus Thinking Multiplication

Prior Learning

1. Is $831 \text{ mL} \div 4$ greater or less than 200 mL?

2. Solve: $24 \times 2 + 1 \times 2$

3. Estimate the total cost using rounding to the nearest dollar:
 $\$4.69 + \$3.10 + \$4.69 + \3.10

4. Solve: $4900 \div 0$

5. Is 91 a prime number?

6. Is 1009 divisible by 3?

Answers

Greater

50

\$16

Undefined

No (7×13)

No

Grade 8 Questions

7. Which of the following are perfect squares?
 64, 640, 6400, 64 000, 640 000

8. Which of the following are perfect squares?
 0.1, 1, -10, 100, 1000

9. Which of the following are perfect squares?
 -49, 7, 49, 70, 490, 700

10. Name the perfect squares between -10 and 10.

64, 6400,
640 000

1, 100

49

1, 4, 9

Other Questions

11.

12.

Mental Math

Grade 8 Mathematics

A-11

Learning Target	Operations with Whole Numbers (Number Strand: 8.N.1, N.7)
Strategies of Focus	Various

Prior Learning	Answers
1. Place the following integers from lowest to highest: 3, -2, 1, -5, -1	-5, -2, -1, 1, 3
2. Use <, >, or =: -14 _____ -15	-14 > -15
3. What are all of the factors of 27?	1, 3, 9, 27
4. What are the prime factors of 60?	2, 3, 5
5. What are the first four multiples of 7?	7, 14, 21, 28
6. What are the common factors of 16 and 24?	1, 2, 4, 8
Grade 8 Questions	
7. Use <, >, or =: $\sqrt{1600}$ _____ 7×7	40 < 49
8. Which numbers are NOT perfect squares? 16, 18, 9, 34, 144	18, 34
9. Solve and simplify: $-1 \times \sqrt{37 + 9 + 3}$	-7
10. Solve and simplify: $\sqrt{64} \div (-2)$	-4
Other Questions	
11.	
12.	

Mental Math

Grade 8 Mathematics

A-12

Learning Target Operations with Whole Numbers (Number Strand: 8.N.1, N.7)

Strategies of Focus Place-Value Partitioning

Prior Learning

1. What is Tim's salary if he earns \$901 per paycheque for 40 weeks?

\$36,040

2. Calculate: $2 + 29\,400 \div 7$

4202

3. A construction crew of 15 people earns \$45,165 for building a home. How much does each receive?

\$3011

4. The price of a box of doughnuts is \$5.79. Can this cost be divided evenly among three students?

Yes, if paid by debit, credit, or cheque.
No, if by cash (\$1.93 each).

5. How many cm are in $\frac{1}{2}$ a kilometre?

50 000 cm

6. Betty goes into debt \$4 each day. When she reaches $-\$1000$, the bank will cancel her credit card. How long does she have?

250 days

Grade 8 Questions

7. You owe \$126 and pay it off in weekly payments of \$6. How long until you have paid off your debt?

21 weeks

8. Solve: $354 \times (-3)$

-1062

9. Solve and simplify: $\sqrt{-256 \div (-4)}$

8

10. Temperatures over 4 days were -5°C , 0°C , 2°C , and -9°C . What is the average?

-3°C

Other Questions

11.

12.

Answers

Mental Math

Grade 8 Mathematics

A-13

Learning Target	Representation of Rational Numbers (Number Strand: 8.N.4)
Strategies of Focus	Doubling and/or Halving

Prior Learning	Answers
For questions 1 to 6, solve as indicated.	
1. 14×35	$7 \times 70 = 490$
2. $144 \div 4$	$144 \div 2 \div 2 = 36$
3. $\frac{1}{2} \times \frac{6}{8}$	$1 \times \frac{3}{8} = \frac{3}{8}$
4. 15×16	$30 \times 8 = 240$
5. 250×36	$500 \times 18 = 1000 \times 9 = 9000$
6. 1.25×24	$5 \times 6 = 30$
Grade 8 Questions	
7. Find unit rate: A snowmobile travels 400 km in 8 hours.	50 km/h
8. Express as a ratio in lowest form: 30 kids to 2 adults	15:1
9. A pancake recipe uses 3 cups of flour and 4 eggs. How many eggs are needed when $4\frac{1}{2}$ cups of flour are used?	6 eggs
10. A chili recipe uses 6 jalapeños, 4 cans of tomato sauce, and 2 green peppers. How many jalapeños are needed in a batch using 6 cans of tomato sauce?	9 jalapeños
Other Questions	
11.	
12.	

Mental Math

Grade 8 Mathematics

A-14

Learning Target Representation of Rational Numbers (Number Strand: 8.N.4)

Strategies of Focus Rounding Strategies

Prior Learning

1. Estimate: $2\frac{1}{8} \times 3\frac{7}{9}$

2. Estimate: $211.15 \div 3$

3. Estimate: 4.1×24.86

4. Which will be the greatest?

4.3×3 $3 \times 4\frac{1}{3}$ $25.75 \div 2$ $1.5(7 \times 0.5)$

5. Order the following from least to greatest: 200% , $\frac{9}{4}$, 0.256 , 0.2501 , $\frac{4}{9}$

6. Round to the nearest tenth:

fifty-four thousand, seven hundred two, and forty-five hundredths

Answers

≈ 8

≈ 70

≈ 100

$3 \times 4\frac{1}{3}$

$0.2501, 0.256$
 $\frac{4}{9}, 200\%, \frac{9}{4}$

54 702.5

Grade 8 Questions

7. What is the cost per sock if six pairs are on sale for \$17.99?

\$1.50 per sock

8. Which is the better deal?
five hockey pucks for \$21.97 or eight for \$29.99

8 for \$29.99

9. Which is the better deal?
a dozen mini-doughnuts for \$3.07 or 25¢ each

25¢ each

10. Which is slower?
1.345 metres per second or 900 kilometres per hour

1.345 m/s

Other Questions

11.

12.

Mental Math

Grade 8 Mathematics

A-15

Learning Target	Representation of Rational Numbers (Number Strand: 8.N.4)		
Strategies of Focus	Memorization		
Prior Learning		Answers	
1. Express as a part-to-part ratio: 4 cans of water, 1 can of juice		4:1	
2. Express as a part-to-whole ratio: 4 cans of water, 1 can of juice		4:5	
3. Express $\frac{1}{4}$ as a percent and a decimal to two decimal points.		25%, 0.25	
4. Express $\frac{1}{10}$ as a percent and a decimal to two decimal points.		10%, 0.10	
5. Express $\frac{1}{20}$ as a percent and a decimal to two decimal points.		5%, 0.05	
6. Express $\frac{1}{3}$ as a percent and a decimal to two decimal points.		$\approx 33\%$, 0.33	
Grade 8 Questions			
7. Is $\frac{2}{3}$ closer to 0.66 or 0.67?		0.67	
8. From the set of whole numbers from 1 to 9, what is the ratio of prime numbers to composite numbers in lowest terms?		1:1	
9. Write each part-to-part ratio as a fraction of the whole in simplest terms: 4:6, 2:30, 1:9		$\frac{2}{5}$, $\frac{1}{16}$, $\frac{1}{10}$	
10. Write each part-to-whole ratio as a fraction in simplest terms: 4:6, 2:30, 1:9		$\frac{2}{3}$, $\frac{1}{15}$, $\frac{1}{9}$	
Other Questions			
11.			
12.			

Mental Math

Grade 8 Mathematics

A-16

Learning Target Representation of Rational Numbers (Number Strand: 8.N.4)

Strategies of Focus Halving and/or Doubling

Prior Learning

Answers

1. Ben drives down the Number 1 Highway at 100 km/h. How far will he travel in one hour?
2. How far will he travel in half an hour?
3. How far will he drive in fifteen minutes?
4. How far will he drive in ten and one-half hours?
5. There are 24 teachers and 400 students in Dawson Trail School. What is the teacher-to-student ratio?
6. The distance from Long Plain to Portage la Prairie is 25 km. How long will it take you to bike if you travel at 12.5 km/h?

100 km

50 km

25 km

1050 km

3:50

2 hours

Grade 8 Questions

In your grocery cart, there are 2.8 kg of apples, 2.5 kg of oranges, 5.5 kg of potatoes, 3.2 kg of cereal, 0.4 kg of salami, and 4.2 kg of watermelon. Answer questions 7 to 10 using this information.

7. What is the ratio, in simplest form, of fruit to vegetables?
8. What is the ratio of cereal to salami?
9. What is the ratio of oranges to potatoes?
10. What is the ratio of potatoes to watermelon to salami?

19:11

8:1

5:11

55:42:4

Other Questions

11.

12.

Mental Math

Grade 8 Mathematics

A-17

Learning Target	Representation of Rational Numbers (Number Strand: 8.N.4)		
Strategies of Focus	Finding Compatible Numbers		
Prior Learning	Answers		
1. Solve: $\frac{1}{5} + \frac{3}{4} + \frac{4}{5}$	$1\frac{3}{4}$		
2. Solve: $\frac{1}{2} + \frac{3}{5} + 1\frac{1}{2} + \frac{5}{25}$	$2\frac{4}{5}$		
3. Eve spends 28% of her day sleeping, 32% at school, 6% doing homework, and 4% doing chores. What percentage of time does she have left in a day?	30%		
4. Solve: $\frac{1}{6} + 7\frac{5}{6} - \frac{5}{7}$	$7\frac{2}{7}$		
5. Jaylow walks 1.64 km to school, 2.36 km at recesses, and 1.64 km home. How many km does she walk?	5.64 km		
6. A brand of cereal is 17% sugar, 40% flour, and 3% tuna. What is the ratio, in lowest terms, of sugar and tuna to all other ingredients?	1:4		
Grade 8 Questions			
7. You earn \$10/hr. cleaning rides at the fair. From Monday to Saturday, you work 4.5 hr., 3.75 hr., 2.5 hr., 7 hr., 7.25 hr., and 8 hr. How much do you earn?	\$330		
8. Your dad gives you \$16/week for helping with farm work. If the chores take you 15 minutes every weekday morning, 30 minutes after school every day, $3\frac{1}{2}$ hours on Saturday, and 45 minutes on Sunday, what is your hourly pay?	\$2/hour		
9. A tree grows 21.7 cm in spring, 16.3 cm in summer, 7.6 cm in fall, and 2.4 cm in winter. What is its average growth rate per month this year?	4 cm per month		
10. A mall parking lot has 25 trucks, 59 vans, 25 bicycles, 92 cars, 8 motorcycles, and 41 SUVs. What is the ratio of motorized to non-motorized vehicles?	9:1		
Other Questions			
11.			
12.			

Mental Math

Grade 8 Mathematics

A-18

Learning Target Representation of Rational Numbers (Number Strand: 8.N.4)

Strategies of Focus Benchmarks

Prior Learning

1. Which is closer to $\frac{1}{2}$? $\frac{1}{3}$ 0.33 33% 67%
2. Which is closer to 45%? $\frac{1}{4}$ $\frac{1}{8}$ $\frac{1}{3}$ $\frac{2}{5}$
3. Who scored closer to the class average of 75% on the test?
 Zander: $\frac{40}{60}$ Malik: $\frac{44}{60}$ Jarak: $\frac{55}{60}$
4. Order the following from least to greatest: $\frac{3}{7}$ $\frac{1}{2}$ $\frac{9}{5}$ $\frac{5}{9}$ $\frac{1}{11}$
5. Which fraction is closest to 4.2? $4\frac{5}{7}$ $\frac{9}{2}$ $\frac{4}{2}$ $4\frac{1}{10}$
6. Which of the following fractions is equivalent to a repeating decimal?
 $2\frac{7}{8}$ $\frac{4}{6}$ $\frac{3}{6}$ $\frac{9}{6}$

Answers

$\frac{1}{3}$

$\frac{2}{5}$

Malik

$\frac{1}{11}$ $\frac{3}{7}$ $\frac{1}{2}$ $\frac{5}{9}$ $\frac{9}{5}$

$4\frac{1}{10}$

$\frac{4}{6}$

Grade 8 Questions

7. Which is the better deal? \$3 for four of your favourite songs, or \$2 for three of your favourite songs
8. Who is faster? James Waabooz ran 4 km in 9 minutes; Shirley Mikinaakose ran 5 km in 10 minutes
9. Put the following in order from fastest to slowest: a snail at 2 km in 11 hours, a turtle at 3 km in 12 hours, a goldfish at 1 km in 2 hours, and a three-legged horse at 7 km in 16 hours
10. Mr. Cone cuts lawns for 8 hours and gets \$70 and Mrs. Cube works in a store and earns \$10/hr. Is Mr. Cone making more or less than Mrs. Cube per hour?

\$2 for 3

Shirley
Mikinaakose

goldfish, horse,
turtle, snail

Less

Other Questions

11.

12.

Mental Math

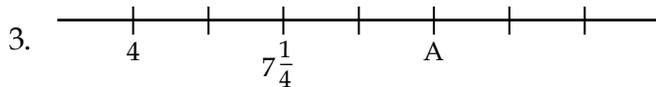
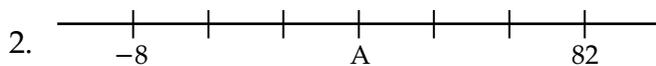
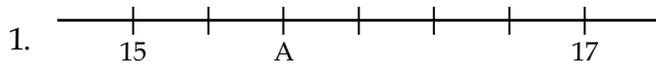
Grade 8 Mathematics

A-19

Learning Target	Representation of Rational Numbers (Number Strand: 8.N.4)
Strategies of Focus	Various

Prior Learning

For questions 1 to 4, find the value of A.



- What fraction of a dollar is a quarter?
- Six out of the 25 students in this math class will mistakenly wear their grandmothers' clothes to school every Tuesday. What is the percentage of students who continually make this mistake?

Answers

$15\frac{2}{3}$

37

$10\frac{1}{2}$

$11\frac{2}{3}$

$\frac{1}{4}$

24%

Grade 8 Questions

- Find unit rate: a snowmobile travels 400 km in 8 hours
- Is the following a rate or a ratio? 30 kids to 2 adults
- Is the following a rate or a ratio? 10 miles in 2 hours
- A map has a scale of 1 : 100 000. How far is it between Winnipeg and Thompson if the distance on the map is 7.5 cm?

50 km/h

Ratio

Rate

7.5 km

Other Questions

11.

12.

Mental Math

Grade 8 Mathematics

A-20

Learning Target Representation of Rational Numbers (Number Strand: 8.N.4)

Strategies of Focus Working from left to right

Prior Learning

Answers

1. Calculate: $0.124 + 0.264$

0.388

2. Calculate: $12.4 + 13.5 + 68.5$

94.4

3. Calculate: $146 + 78 + 101$

325

4. Calvin gets paid \$10/hr. to play online video games. He plays for 15.4 minutes, then for 14.2 minutes, and then for 10.4 minutes. How much should he get paid?

\$6.67

5. After a party, 80% of a cheese pizza, 75% of a pepperoni pizza, and 45% of an anchovy pizza are left. How many full pizzas can be made from the leftovers?

2 pizzas

6. Tickets to the concert cost \$10 plus 15% tax. Does Ivan have enough if he finds the following amounts under couch cushions: \$3.25, \$4.15, \$1.60, and \$2.35?

No (He needs 15 cents more.)

Grade 8 Questions

7. Teams in a 10-hour paintball tournament use 2436, 1253, and 1011 paintballs each. How many paintballs did they use per hour?

470
paintballs/hr.

8. The distances from East Kildonan to Point Douglas to the Maples and back are 5.21 km, 8.15 km, and 12.64 km. How long does it take to bike this trip at 13 km/h?

2 hours

9. Mallory spends the following amounts of time on her phone in one day: 18 minutes, $16\frac{1}{2}$ minutes, $18\frac{1}{2}$ minutes, $16\frac{1}{4}$ minutes, 27 minutes, and $23\frac{3}{4}$ minutes. What is the ratio of time Mallory spends on her phone to the time she spends away from her phone?

1:11

10. Ty's penalty minutes in a hockey game were 4:00, 2:15, and 3:45. The game was 60 minutes long. What was the ratio of time spent in the penalty box to total game time?

1:6

Other Questions

11.

12.

Mental Math

Grade 8 Mathematics

A-21

Learning Target	Operations with Rational Numbers (Number Strand: 8.N.2, N.3, N.5, N.6, N.8)
Strategies of Focus	Estimation

Prior Learning	Answers
1. What two whole numbers will $7\frac{2}{5} + 9\frac{9}{11}$ be between?	17 and 18
2. What two whole numbers will $16\frac{1}{7} + 21\frac{5}{11}$ be between?	37 and 38
3. Will $5\frac{2}{5} + 13\frac{1}{3}$ be closer to 18 or 19?	19
4. Will $\frac{42}{5} + \frac{7}{8}$ be closer to 9 or 10?	9
5. Will $15\frac{2}{5} - 1\frac{1}{3}$ be closer to 13 or 14?	14
6. Will $\frac{12}{5} - 1\frac{1}{3}$ be closer to 0 or 1?	1
Grade 8 Questions	
7. Is $\sqrt{34}$ closer to 5 or to 6?	6
8. Estimate: $\sqrt{17}$	≈ 4.1
9. \sqrt{n} is between 9 and 10. What whole number might n equal?	$82 \leq n \leq 99$
10. \sqrt{n} is between 6 and 6.5. What whole number might n equal?	$37 \leq n \leq 42$
Other Questions	
11.	
12.	

Mental Math

Grade 8 Mathematics

A-22

Learning Target	Operations with Rational Numbers (Number Strand: 8.N.2, N.3, N.5, N.6, N.8)
Strategies of Focus	Estimation

Prior Learning	Answers
1. The drive from Gimli to Emerson is 200 km. How long will it take to drive this at 100 km/h?	2 h
2. The drive from Melita to Gretna is 300 km. About how long will it take to drive this at 80 km/h?	$3\frac{1}{2}$ to 4 h (3 h, 45 min.)
3. The drive from Minot to Grand Forks is 210 miles. About how long will it take to get there driving 68 miles per hour?	\approx 3 hr.
4. How fast do you bike in km/h if it takes you 4 minutes to bike a kilometre?	15 km/h
5. Estimate the time each Grade 8 student spends in math class this month.	\approx 16 to 22 hours
6. Estimate the value of a stack of quarters 1 metre tall. A roll of quarters is 7 cm long and worth \$10.	\approx \$135 to \$145
Grade 8 Questions	
7. What two whole numbers is $\sqrt{30}$ between?	5 and 6
8. Less than, greater than, or equal? 8 _____ $\sqrt{80}$	$<$
9. Less than, greater than, or equal? 9 _____ $\sqrt{99}$	$<$
10. Less than, greater than, or equal? 11 _____ $\sqrt{66}$	$>$
Other Questions	
11.	
12.	

Mental Math

Grade 8 Mathematics

A-23

Learning Target	Operations with Rational Numbers (Number Strand: 8.N.2, N.3, N.5, N.6, N.8)
Strategies of Focus	Estimation

Prior Learning	Answers
1. The distance from The Pas to Winnipeg is 628 km. At an average speed of 80 km/h, about how long would this trip take?	Slightly less than 8 hours
2. Four classes with 21 students each need to take a field trip to the box factory. Each bus holds 25 students. How many buses are needed?	4 buses
3. Sales taxes in Manitoba are 8% PST and 5% GST. What is the approximate total cost for a new phone priced at \$99?	≈ \$113
4. You received a terrible haircut. You want to tip 5% or slightly less. The final bill is \$20.99. What should you tip?	Below \$1.05
5. Beth is a great waitress. She expects a 15% tip from a man who had a meal worth \$12.35. He left her \$1.30. Is this reasonable?	Not really, as this is under 11%
6. Estimate the cost: 10% off a shirt worth \$29.97	≈ \$27
Grade 8 Questions	
7. Less than, greater than, or equal? $\sqrt{20}$ ____ 4.9	<
8. Less than, greater than, or equal? $\sqrt{96}$ ____ $9\frac{1}{10}$	>
9. Less than, greater than, or equal? $\sqrt{625}$ ____ 25	=
10. Less than, greater than, or equal? 3 ____ $\sqrt{6}$	>
Other Questions	
11.	
12.	

Mental Math

Grade 8 Mathematics

A-24

Learning Target	Operations with Rational Numbers (Number Strand: 8.N.2, N.3, N.5, N.6, N.8)
Strategies of Focus	Rounding

Prior Learning

1. Which of the following is closest to 17.58×13.40 ?
 228 3228.58 28.5814 428
2. Solve 1.5×1.5 to the nearest tenth.
3. Estimate the value of a 9% tip on a \$21.99 haircut.
4. A bag of raisins weighs 885 grams. Kyle needs 300 g to make cookies for a party starting in 12 minutes. If $\frac{1}{3}$ of a bag is all he has, should he try to get to the store before his party?
5. If Ana completes $\frac{3}{8}$ of her homework, and Sara completes $\frac{4}{9}$, who is closer to being done?
6. A recipe calls for 500 mL of tomato paste. Gerri wants to triple the recipe. Cans only come in 355 mL. How many cans will she need?

Answers

228

2.3

\approx \$2 (\$1.98)

No, he has nearly enough.

Sara

5 cans

Grade 8 Questions

7. Less than, greater than, or equal? $\sqrt{1}$ _____ 1
8. Less than, greater than, or equal? $\sqrt{2}$ _____ 2
9. Less than, greater than, or equal? $\sqrt{11}$ _____ 66
10. Less than, greater than, or equal? $\sqrt{7} \times \sqrt{7}$ _____ $\sqrt{49}$

=

<

<

=

Other Questions

11.

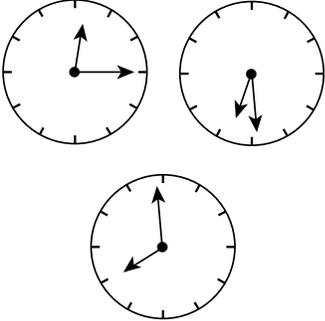
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Mental Math

Grade 8 Mathematics

A-25

Learning Target	Operations with Rational Numbers (Number Strand: 8.N.2, N.3, N.5, N.6, N.8)
Strategies of Focus	Memorization

Prior Learning	Answers
1. How many months have 30 days each year?	4
2. How many days are there in most years?	365
3. What meal time does each most closely represent?	Lunch Supper
	≈ 7:58
4. What time does this represent?	Morning
5. Is 10:00 AM in the morning or at night?	-81
6. Calculate: -9×9	
Grade 8 Questions	
7. Simplify: $\sqrt{\sqrt{16}}$	2
8. Solve and simplify: $\sqrt{\sqrt{25} + \sqrt{16}}$	3
9. Solve and simplify: $\frac{\sqrt{100}}{\sqrt{4}}$	5
10. Solve and simplify: $\sqrt{\frac{100}{4}}$	5
Other Questions	
11.	
12.	

Mental Math

Grade 8 Mathematics

A-26

Learning Target	Operations with Rational Numbers (Number Strand: 8.N.2, N.3, N.5, N.6, N.8)
Strategies of Focus	Various

Prior Learning

1. Jim watches 12% of a movie, then 14%, then 16%, and then 28%. How much is left to watch?
2. Audrey ate $\frac{1}{4}$ of a chocolate bar, then $\frac{3}{8}$, and then another $\frac{1}{4}$. How much is left?
3. Solve: $-33 + 19$
4. If it is 5°C in Boissevain and -17°C in Brochet, what is the temperature difference?
5. Solve: $34 \div 0.5$
6. If one gummy worm costs \$0.29, how much do 100 gummy worms cost?

Answers

30%

$\frac{1}{8}$

-14

22°C

68

\$29

Grade 8 Questions

For questions 7 to 10, solve and simplify.

7. $\sqrt{4} \times \sqrt{4}$
8. $\sqrt{81} \times \sqrt{81}$
9. $\sqrt{73.5} \times \sqrt{73.5}$
10. $\sqrt{a} \times \sqrt{a}$

4

81

73.5

a

Other Questions

11.

12.

Mental Math

Grade 8 Mathematics

A-27

Learning Target	Operations with Rational Numbers (Number Strand: 8.N.2, N.3, N.5, N.6, N.8)
Strategies of Focus	Various

Prior Learning	Answers
1. What whole number is $\frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5}$ closest to?	1
2. One-fifth of the 55 Grade 12 students have cars. What percentage is this?	20%
3. If you run at 4 m/s for 400 seconds, how many kilometres will you run?	1.6 km
4. William needs 80% on his next math test. If it's out of 60 marks, how many marks does he need?	48 marks
5. Solve: $\frac{2}{5} + \frac{57}{10}$	$6\frac{1}{10}$
6. Solve: $\frac{3}{5} - \frac{8}{25}$	$\frac{7}{25}$
Grade 8 Questions	
7. Estimate the cost: 10% off a shirt worth \$49.23	$\approx \$44$ (\$44.31)
8. What is $\frac{1}{3}$ of a half of a pizza?	$\frac{1}{6}$
9. What percent is 16 cents of 2 dollars?	8%
10. What percent is 16 cents of 50 cents?	32%
Other Questions	
11.	
12.	

Mental Math

Grade 8 Mathematics

A-28

Learning Target	Operations with Rational Numbers (Number Strand: 8.N.2, N.3, N.5, N.6, N.8)
Strategies of Focus	Various

Prior Learning	Answers
1. Evaluate: $43 \div 0.5$	86
2. How many cm are equivalent to 63 mm?	6.3 cm
3. A pair of \$200 hockey skates is on sale for 40% off. What is the cost?	\$120
4. If you read 140 pages of a 338-page book, how many more do you have to read?	198 pages
5. If you buy an item costing \$8.78 with a \$10 bill, how much change will you get in Canada?	\$1.20
6. If you buy an item costing \$9.31 with a \$10 bill, how much change will you get in Canada?	70¢
Grade 8 Questions	
7. What is the area of a $8\frac{1}{2}$ -inch by 11-inch piece of paper?	$93\frac{1}{2}$ inches ²
8. How many half-dozen packages of eggs does it take to get 360 eggs?	60 packages
9. Solve and simplify: $\sqrt{64} + (-10)$	-2
10. Solve and simplify: $-\sqrt{144} \times -10$	120
Other Questions	
11.	
12.	

Mental Math

Grade 8 Mathematics

A-29

Learning Target	Operations with Rational Numbers (Number Strand: 8.N.2, N.3, N.5, N.6, N.8)	
Strategies of Focus	Various	
Prior Learning		Answers
1. If you buy an item worth \$55.55 and pay with 3 twenty-dollar bills, how much change will you get in Canada?		\$4.45
2. If you buy an item worth \$134.17 and pay with 3 fifty-dollar bills, how much change will you get in Canada?		\$15.85
3. If you buy an item worth \$134.17 and pay with 3 fifty-dollar bills, how much change will you get in North Dakota?		\$15.83
4. Beth is 42 years old. Her son, Spencer, is 14 years old. How old was Beth when she had Spencer?		27 or 28 years old
5. Which of the following numbers are divisible by 7? 98 119 784 77		All of them
6. Solve: $-42 + (-8)$		-50
Grade 8 Questions		
7. Ken needs $\frac{2}{3}$ of a cup of milk to make a batch of pancakes. He only has $\frac{2}{5}$ of a cup. Does he have enough to make a half-batch?		Yes
8. Solve: $\frac{3}{4} \div \frac{1}{2}$		$1\frac{1}{2}$
9. Harli gets 5% of farm earnings for helping on her family farm. How much does she get when the farm earns \$400?		\$20
10. Solve: $\frac{5}{7} \times \frac{14}{10}$		1
Other Questions		
11.		
12.		

Mental Math

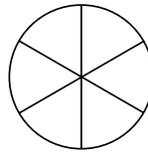
Grade 8 Mathematics

A-30

Learning Target	Operations with Rational Numbers (Number Strand: 8.N.2, N.3, N.5, N.6, N.8)
Strategies of Focus	Various

Prior Learning

1. What is 75% of 4?
2. How much is 80% of 50?
3. How many slices in $\frac{1}{4}$ of this pizza?
4. How many slices are there in $2\frac{1}{2}$ of these pizzas?
5. How many slices in $\frac{7}{12}$ of these pizzas?
6. How many slices in 75% of a pizza?



Answers

3

40

$1\frac{1}{2}$ slices

15 slices

$3\frac{1}{2}$ slices

$4\frac{1}{2}$ slices

Grade 8 Questions

7. Solve: $\frac{3}{4} \times \frac{3}{4}$
8. What is 25% of $2\frac{1}{2}$?
9. Solve: $2 \times \frac{1}{4}$
10. Solve: $2 \times 3\frac{1}{4}$

$\frac{9}{16}$

$\frac{5}{8}$

$\frac{1}{2}$

$6\frac{1}{2}$

Other Questions

11.

12.

Mental Math

Grade 8 Mathematics

A-31

Learning Target	Operations with Rational Numbers (Number Strand: 8.N.2, N.3, N.5, N.6, N.8)
Strategies of Focus	Various

Prior Learning	Answers
1. What is the price of 3 apps at \$1.99 each?	\$5.97
2. Transcona's hockey team has 15 players. Five are taller than 2 m. What fraction does this represent?	$\frac{1}{3}$
3. Is $-48.7 \div -3$ positive or negative?	Positive
4. Solve: $\frac{1}{5} + \frac{1}{4}$	$\frac{9}{20}$
5. MegaFurniture Store sells 305 skrivbord kits from Monday to Friday. How many units is this per day, on average?	61 kits
6. Write $\frac{4}{5}$ as a decimal.	0.8
Grade 8 Questions	
7. Solve: $\frac{1}{4} \times \frac{1}{4}$	$\frac{1}{16}$
8. Solve: $\frac{3}{4} \times \frac{1}{4}$	$\frac{3}{16}$
9. What whole numbers will $3\frac{2}{5} \times 2\frac{1}{2}$ be between?	8 and 9
10. Solve and simplify: $\sqrt{\frac{5}{2} \div \frac{1}{10}}$	5
Other Questions	
11.	
12.	

Mental Math

Grade 8 Mathematics

A-32

Learning Target Patterning and Algebraic Thinking (Patterns and Relations: 8.PR.1)

Strategies of Focus Various

Prior Learning

1. What number, increased by five, gives two?
2. What number, doubled, gives sixteen?
3. The sum of what number and five gives negative ten?
4. The sum of what number and negative five gives ten?
5. The sum of what number and negative five gives negative ten?
6. The product of what number and negative eight gives sixteen?

Answers

-3

8

-15

15

-5

-2

Grade 8 Questions

For questions 7 to 10, solve for y , where $x = 5$.

7. $2x + 1 = y$
8. $y = 2x + 1$
9. $3(2x + 1) = y$
10. $3(2x + 1) = 3y$

$y = 11$

$y = 11$

$y = 33$

$y = 11$

Other Questions

11.

12.

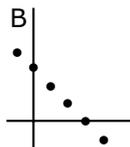
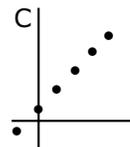
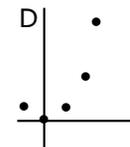
Mental Math

Grade 8 Mathematics

A-33

Learning Target	Patterning and Algebraic Thinking (Patterns and Relations: 8.PR.1)
Strategies of Focus	Distribution and Commutative Property

Prior Learning	Answers
1. What number, divided by three, gives fifteen?	45
2. Does $2x + 7$ always equal $7 + 2x$?	Yes
3. Does $2x - 7$ always equal $7 - 2x$?	No
4. Does $(2x) \times 7$ always equal $7 \times 2x$?	Yes
5. Does $2x \div 7$ always equal $7 \div 2x$?	No
6. Does $\frac{2x}{7}$ always equal $2x \div 7$?	Yes

Grade 8 Questions												
7. Complete the table of values for $y = 3x + 4$.	<table border="1" style="display: inline-table; border-collapse: collapse; text-align: center;"> <tr> <td style="padding: 2px 10px;">x</td> <td style="padding: 2px 10px;">-10</td> <td style="padding: 2px 10px;">1</td> <td style="padding: 2px 10px;">10</td> <td style="padding: 2px 10px;">50</td> </tr> <tr> <td style="padding: 2px 10px;">y</td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	x	-10	1	10	50	y					-26, 7, 34, 154
x	-10	1	10	50								
y												
8. Which graph would best match $y = 3x + 4$?	<div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;"> <p>A</p>  </div> <div style="text-align: center;"> <p>B</p>  </div> <div style="text-align: center;"> <p>C</p>  </div> <div style="text-align: center;"> <p>D</p>  </div> </div>	C										
9. Does $3x + 4 = 3(x + 4)$? How do the brackets make a difference?		$3(x + 4) = 3x + 12$ Distribution										
10. Solve for x : $3(x - 1) = 9$		$x = 4$										

Other Questions	
11.	
12.	

Mental Math

Grade 8 Mathematics

A-34

Learning Target

Patterning and Algebraic Thinking (Patterns and Relations: 8.PR.1)

Strategies of Focus

Distribution and Commutative Property

Prior Learning

Answers

1. Is $2x + 8 - 9 = (2x + 8) - 9$? Why?

Yes, the commutative property.

2. Is $x - 9$ always equal to $x + (-9)$?

Yes

3. Find the error for the equation $2(m + 7) = r$.

m	0	3	6	10
r	0	20	26	34

$m = 0$
 $r = 0$

4. Solve: $49 \div 7$

7

5. Solve: $7 \div 49$

$\frac{1}{7}$

6. Solve: $0 \div 49$

0

Grade 8 Questions

7. Complete the table of values for $2x = y$.

x	-3	10	50	100
y				

-6, 20, 100, 200

8. Will graphs of $y = 3x - 4$ and $y = -4 + 3x$ be parallel, perpendicular, intersecting, or will they be the same line?

Same line

9. Will graphs of $y = 2(x - 4)$ and $y = 2x - 4$ be parallel, perpendicular, intersecting, or will they be the same line?

Parallel

10. Will graphs of $y = 2x$ and $y = -2x$ be parallel, perpendicular, intersecting, or will they be the same line?

Perpendicular

Other Questions

11.

12.

Mental Math

Grade 8 Mathematics

Learning Target	Patterning and Algebraic Thinking (Patterns and Relations: 8.PR.1)
Strategies of Focus	Visualization

Prior Learning

For questions 1 to 6, use the graphs shown below.

A

B

C

1. Which of the above graphs is a linear relation?
2. Write the missing value for (___, 4) on graph A.
3. Create a table of values for graph C.
4. What is the value for y on graph B where $x = 4$?
5. Find the missing value for (5, ___) on graph B.
6. Which graph could represent the growth of a tomato plant over time?

Answers

C								
$y = 3$								
<table border="1" style="border-collapse: collapse; width: 100%;"> <tr><td style="padding: 2px;">x</td><td style="padding: 2px;">1</td><td style="padding: 2px;">3</td><td style="padding: 2px;">5</td></tr> <tr><td style="padding: 2px;">y</td><td style="padding: 2px;">1</td><td style="padding: 2px;">2</td><td style="padding: 2px;">3</td></tr> </table>	x	1	3	5	y	1	2	3
x	1	3	5					
y	1	2	3					
$y = 3$								
$x = 1$								
C								

Grade 8 Questions

7. If a star = 12 and a diamond = 5, what does a heart equal?
8. If a star = 24, what does a diamond equal?
9. If a diamond = $\frac{1}{2}$, what does a heart equal?
10. Which shape is the lightest?

Heart = 15
Diamond = 10
Heart = $1\frac{1}{2}$
Diamond

Other Questions

- 11.
- 12.

Mental Math

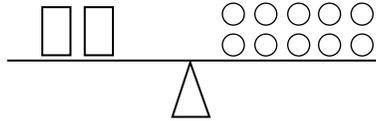
Grade 8 Mathematics

A-36

Learning Target	Algebraic Representations with Equations (Patterns and Relations: 8.PR.2)
Strategies of Focus	Various

Prior Learning

Use the diagram shown on the right to answer questions 1 to 6.



1. How many circles are equal to 1 rectangle?
2. How many rectangles are equal to 100 circles?
3. How many circles are equal to 5 rectangles?
4. How many rectangles will balance 25 circles?
5. If you removed 3 circles from the right, how much of a rectangle would need to be removed for the scale to stay balanced?
6. If you add 9 circles to the left, how many rectangles do you need to add to the right to stay balanced?

Answers

- 5 circles
- 20 rectangles
- 25 circles
- 5 rectangles
- $\frac{3}{5}$ of a rectangle
- $1\frac{4}{5}$ rectangles

Grade 8 Questions

7. Complete the table of values for $-2x = y$.

x	3	10	50	100
y				
8. Solve for x : $\frac{x}{2} + 5 = 11$
9. If you add the same number to both sides of this equation, will x change?

$$\frac{x}{2} + 5 + \square = 11 + \square$$
10. If you subtract the same number from both sides of this equation, will x change? Why or why not?

$$\frac{x}{5} + 2 - \square = 16 - \square$$

- $-6, -20, -100, -200$
- $x = 12$
- No
- No, preservation of equality

Other Questions

- 11.
- 12.

Mental Math

Grade 8 Mathematics

A-37

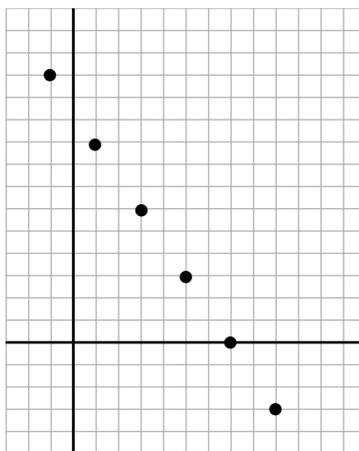
Learning Target Algebraic Representations with Equations (Patterns and Relations: 8.PR.2)

Strategies of Focus Various

Prior Learning

Use the graph shown below to answer questions 1 to 6.

1. Make a table of values for the graph.
2. What would be the value of y for $x = 11$?
3. What would be the value of y for $x = 0$?
4. What is the missing value for the ordered pair $(3, \underline{\quad})$?
5. What is the missing value for the ordered pair $(\underline{\quad}, 3)$?
6. Would a graph of $y = 6$ be parallel, perpendicular, or intersect this graph?



Answers

x	-1	1	3	5	7	9
y	12	9	6	3	0	-3

$$y = -6$$

$$y = 10\frac{1}{2}$$

6

5

Intersect

Grade 8 Questions

7. Solve for x : $\frac{x}{30} = 3$
8. Solve for x : $\frac{x}{2} + 3 = 11$
9. Solve for x : $7(x + 3) = -49$
10. Solve for m : $(13 - m) \div 2 = 6$

$$x = 90$$

$$x = 16$$

$$x = -10$$

$$m = 1$$

Other Questions

11.

12.

Mental Math

Grade 8 Mathematics

A-38

Learning Target	Algebraic Representations with Equations (Patterns and Relations: 8.PR.2)
Strategies of Focus	Visualization and Estimation

Prior Learning

Answers

- | | |
|---|----------------|
| 1. Write the next three terms: $-19, -13, -7, -1, \underline{\quad}, \underline{\quad}, \underline{\quad}$ | 5, 11, 17 |
| 2. Find the missing number in the sequence: $-10, \underline{\quad}, -16, -19$ | -13 |
| 3. Find the missing number in the sequence: $\frac{3}{4}, 1\frac{1}{4}, \underline{\quad}, 2\frac{1}{4}$ | $1\frac{3}{4}$ |
| 4. Pile 1 has 4 blocks, pile 2 has 6 blocks, and pile 3 has 8 blocks. Will there be more than 100 blocks in pile 50? | Yes |
| 5. Wall 1 has 999 bottles, wall 2 has 851 bottles, and wall 3 has 703. Which wall will be the first to have fewer than 450 bottles? | Wall 5 |
| 6. Bowl 1 has 17 fish, bowl 2 has 25 fish, and bowl 3 has 33 fish. Will any bowl ever have an even number of fish? | No |

Grade 8 Questions

- | | | |
|---|--|----------|
| 7. Which graph shown on the right would best match $2x = y$? | | A |
| 8. Does the line $y = x$ pass through $(1, 2)$? | | No |
| 9. Does the line $y = x$ pass through $(4, 4)$? | | Yes |
| 10. Would $y = x + 10$ be closer to passing through $(0, 9)$ or $(12, 0)$? | | $(0, 9)$ |

Other Questions

11.

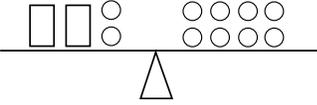
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Mental Math

Grade 8 Mathematics

A-39

Learning Target	Algebraic Representations with Equations (Patterns and Relations: 8.PR.2)
Strategies of Focus	Visualization

Prior Learning	Answers
Write an equation for the word problems given in questions 1 to 5.	
1. A number increased by 5 gives 2	$x + 5 = 2$
2. Double a number makes 16	$2x = 16$
3. A number divided by three equals fifteen	$\frac{x}{3} = 15$
4. Two-thirds of a number is 7	$\frac{2}{3}x = 7$
5. Five is half of a number	$5 = \frac{1}{2}x$
6. How many circles are equal to one rectangle?	3 circles
	
Grade 8 Questions	
7. What is the equation of the straight line passing through (0, 0) and (9, 9)?	$y = x$
8. What is the equation of the straight line passing through (0, 4) and (3, 4)?	$y = 4$
9. What is the equation of the straight line passing through (17, 2) and (17, 3)?	$x = 17$
10. Will a straight line passing through (1, 3) and (3, 5) also pass through (6, 7)?	No
Other Questions	
11.	
12.	

Mental Math

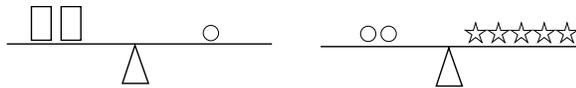
Grade 8 Mathematics

A-40

Learning Target	Algebraic Representations with Equations (Patterns and Relations: 8.PR.2)
Strategies of Focus	Visualization

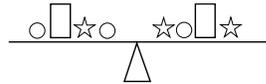
Prior Learning

Use the diagrams shown on the right to answer questions 1 and 2.



1. Which object is the heaviest?
2. Which object is the lightest?

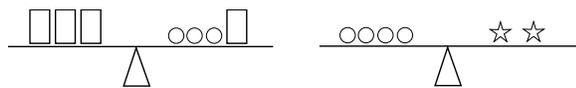
Use the diagram shown on the right to answer questions 3 to 6.



3. If the rectangle was removed from both sides, would the scale remain balanced?
4. If four stars were added to each side, would the scale remain balanced?
5. Which two objects weigh the same?
6. Is the rectangle heavier or lighter than the star?

Grade 8 Questions

Use the diagrams shown on the right to answer questions 7 to 10.



7. If a rectangle is equal to 3, how much is a circle equal to?
8. If a rectangle is equal to 12, how much is a star equal to?
9. If a star is equal to 24, how much is a rectangle equal to?
10. If a star is equal to 12, how much is a rectangle equal to?

Other Questions

11.

12.

Answers

Circle

Star

Yes

Yes

Star/Circle

There is no way to know.

Circle = 2

Star = 16

Rectangle = 18

Rectangle = 9

Mental Math

Grade 8 Mathematics

A-41

Learning Target	Length (Shape and Space: 8.SS.1)		
Strategies of Focus	Estimation and Rounding		
Prior Learning		Answers	
1. The sides of this piece of paper are $8\frac{5}{8}$ by 11 inches. I round $8\frac{5}{8}$ down to 8 and find an approximate perimeter of 38 inches. Will the actual perimeter be greater or less than 38 inches?		Greater	
2. If I round $8\frac{5}{8}$ to 9, I find an approximate perimeter of 40 inches. Will the actual perimeter of this paper be greater or less than 40 inches?		Less than	
3. What would be a reasonable estimation for the area of a circle with a radius of 3 cm?		$\approx 27 \text{ cm}^2$	
4. What is the approximate volume of a 21 cm \times 21 cm \times 30 cm shoebox? Is this an overestimate or an underestimate?		$\approx 12\,000 \text{ cm}^3$ underestimate	
5. To the nearest metre, how wide is a car?		2 metres	
6. Create a formula for finding the perimeter of a regular dodecagon (a 12-sided polygon).		Perimeter = $12 \times \text{side length}$	
Grade 8 Questions			
7. A computer screen is 7 inches by 9 inches. Is the diagonal greater or less than 10 inches?		Greater than 10 inches	
8. A front yard is 10 metres by 8 metres. Is the diagonal across it greater or less than 12 metres?		Greater than 12 m	
9. A TV screen is 50 cm by 80 cm. Is the diagonal greater or less than 100 cm?		Less than 100 cm	
10. A quilt is 2 metres by 2 metres. Is the diagonal greater or less than 3 metres?		Less than 3 metres	
Other Questions			
11.			
12.			

Mental Math

Grade 8 Mathematics

A-42

Learning Target Length (Shape and Space: 8.SS.1)

Strategies of Focus Various

Prior Learning

Answers

1. What is the perimeter of a regular triangle if one side is 5 cm long?

15 cm

2. What is the name of a regular rectangle?

Square

3. Is a regular triangle right, obtuse, or acute?

Acute

4. Is a regular triangle isosceles, equilateral, or scalene?

Equilateral

5. How many mm are in 15.3 cm?

153 mm

6. How many mm are in 205.64 cm?

2056.4 mm

Grade 8 Questions

7. Two short sides of a right triangle are 3 and 4 units. How long is the hypotenuse?

5 units

8. If the lengths of the sides of the above triangle are all doubled, what happens to the measurements of the angles?

They remain the same.

9. Two short sides of a right triangle are 6 and 8 units. How long is the hypotenuse?

10 units

10. The hypotenuse of a right triangle is 15 cm long, and one of the sides is 9 cm. How long is the missing side?

12 cm

Other Questions

11.

12.

Mental Math

Grade 8 Mathematics

A-43

Learning Target Length (Shape and Space: 8.SS.1)

Strategies of Focus Memorization and Visualization

Prior Learning

Answers

1. What is a formula to find the area of a circle?
2. A circle has a diameter of 10 cm. What is the radius?
3. What is the approximate value of pi to two decimal places?
4. If you add the interior angles of any triangle, how many degrees will there be?
5. What will the ratio of the circumference of a circle to its diameter always be equal to?
6. If you add the interior angles of any rectangle, how many degrees will there be?

$$A = \pi r^2 \text{ or}$$

$$A = \pi \times r \times r$$

5 cm

3.14

180°

π

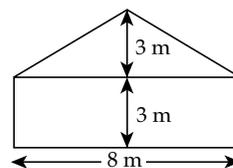
360°

Grade 8 Questions

7. A kite is 80 cm tall and 60 cm across. All of its sides are equal. What is its perimeter?

200 cm

8. Find the perimeter.

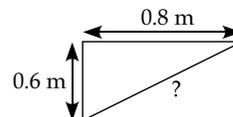


24 m

9. The length of a hypotenuse of a right triangle is $\sqrt{5}$ cm. How long might the sides be?

2 cm and 1 cm

10. Find the diagonal.



1 m

Other Questions

11.

12.

Mental Math

Grade 8 Mathematics

A-44

Learning Target Area (Shape and Space: 8.SS.3)

Strategies of Focus Place-Value Partitioning and Compensation

Prior Learning

1. What is the area of a square with sides of 12 m?
2. What is the area of a rectangle with sides of 16 mm and 19 mm?
3. What is the approximate area of a circle with a radius of 10 cm?
4. What is the approximate area of a circle with a radius of 20 cm?
5. What is the volume of a $21 \times 22 \times 1$ cm rectangular box?
6. What is the volume of a $15 \times 9 \times 2$ unit rectangular prism?

Answers

144 m^2

304 mm^2

$\approx 300 \text{ cm}^2$
(314 cm^2)

$\approx 1200 \text{ cm}^2$
(1257 cm^2)

462 cm^3

270 units^3

Grade 8 Questions

7. What is the surface area of a $3 \times 3 \times 3$ unit cube?
8. If a cube has a surface area of 35 cm^2 on one side, what is its total surface area?
9. Fifteen sugar cubes each have a surface area of 5.5 cm^2 . What is the total surface area of the sugar cubes?
10. What is the surface area of a $15 \text{ cm} \times 15 \text{ cm}$ cube?

54 units^2

210 cm^2

82.5 cm^2

1350 cm^2

Other Questions

11.

12.

Mental Math

Grade 8 Mathematics

A-45

Learning Target Area (Shape and Space: 8.SS.3)

Strategies of Focus Halving and Doubling

Prior Learning

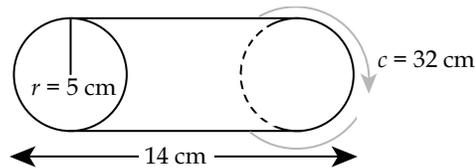
1. What is the area of a rectangle that has sides of 24 cm and 15 cm?
2. What is the area of a rectangle that has sides of 16 cm and 4 cm?
3. What is the area of a right triangle that has lengths of 5.2 cm and 4 cm for its two shortest sides?
4. The area of a rectangle is 128 cm^2 . One of its sides is 8 cm. What is the missing side length?
5. The sides of a rectangle are 160 cm and 250 cm. What is the area?
6. What is the volume of a $3 \times 3 \times 3$ unit cube?

Answers

- 360 cm^2
- 64 cm^2
- 10.4 cm^2
- 16 cm
- 40 000 cm^2
- 27 units^3

Grade 8 Questions

Use the diagram shown on the right to answer questions 7 to 10.



7. Find the area of one of the two circles for the cylinder above. Use 3 for an approximation of pi.
8. What is the area of the curved surface?
9. What is the surface area of the cylinder?
10. What would the area of the curved surface be if the circumference were doubled and the length were halved?

- $\approx 75 \text{ cm}^2$
- 448 cm^2
- $\approx 598 \text{ cm}^2$
- 448 cm^2

Other Questions

11.

12.

Mental Math

Grade 8 Mathematics

A-46

Learning Target Area (Shape and Space: 8.SS.3)

Strategies of Focus Using Compatible Numbers

Prior Learning

1. Distances walked in a day were 3.4 km, 2.9 km, 8.7 km, 2.1 km, and 1.3 km. What is the total distance walked?
2. The lengths of sides on an irregular pentagon are 2.6 cm, 3.4 cm, 6.7 cm, 9.0 cm, and 3.3 cm. What is the perimeter?
3. The lengths of sides on a regular pentagon are each 7.5 cm. What is the perimeter?
4. The lengths of sides on a regular hexagon are each 7.5 cm. What is the perimeter?
5. The lengths of the sides on an irregular octagon are 61, 42, 54, 46, 39, 25, 58, and 15 cm. What is the perimeter?
6. There are 32 patches on a soccer ball. Each has an area of 30 cm^2 . What is the total area?

Answers

18.4 km

25 cm

37.5 cm

45 cm

340 cm

960 cm^2

Grade 8 Questions

7. A box with a surface area of 987 cm^2 has its top removed. Its top was $13 \text{ cm} \times 11 \text{ cm}$. What is the new exterior surface area?
8. A rectangular prism has faces with areas of 126 cm^2 , 134 cm^2 , and 140 cm^2 . What is the total surface area?
9. A rectangular prism has faces with areas of 13.4 mm^2 , 2.2 mm^2 , and 6.6 mm^2 . What is the total surface area?
10. A triangular prism has faces with areas of 60 cm^2 , 60 cm^2 , 60 cm^2 , 15.6 cm^2 , and 15.6 cm^2 . What is the total surface area?

844 cm^2

800 cm^2

44.4 mm^2

211.2 cm^2

Other Questions

11.

12.

Mental Math

Grade 8 Mathematics

A-47

Learning Target	Volume (Capacity) (Shape and Space: 8.SS.4)
Strategies of Focus	Various

Prior Learning	Answers
1. How many mL of water will fit in a 23.5 L tub?	23 500 mL
2. How many litres are equal to 35 750 mL?	35.75 L
3. What is $\frac{3}{4}$ of a litre in mL?	750 mL
4. A cube has all of its sides doubled. What happens to the volume?	It increases eight times.
5. What is the volume of a 4×4 unit cube?	64 units^3
6. What is the area of a square that is 10×14 m?	140 m^2
Grade 8 Questions	
7. The face of a can has an area of 65 cm^2 . It is 10 cm tall. What is the volume?	650 cm^3 650 mL
8. A box has a lid with an area of 175 cm^2 . The box is 20 cm deep. What is the volume?	3500 cm^3
9. A triangular prism has a triangular face with an area of 61.1 cm^2 and is 400 cm deep. What is the volume?	$24\,440 \text{ cm}^3$
10. A rectangular fish tank has a lid with dimensions of 20 cm and 40 cm. It is 25 cm deep. What is its volume?	$20\,000 \text{ cm}^3$ or $20\,000 \text{ mL}$ or 20 L
Other Questions	
11.	
12.	

Mental Math

Grade 8 Mathematics

A-48

Learning Target Volume (Capacity) (Shape and Space: 8.SS.4)

Strategies of Focus Distribution and Compensation

Prior Learning

Answers

- Solve: 21×15
- Solve: 99×5
- True or False: $l \times w \times h = h \times l \times w$
- True or False: $35 \times 19 = (35 \times 20) - 35$
- True or False: $43 \times 15 = (43 \times 10) + (43 \times 5)$
- True or False: $43 \times 15 = (15 \times 40) + (15 \times 3)$

315

495

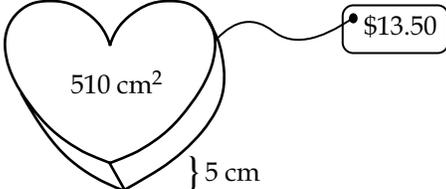
True

True

True

True

Grade 8 Questions

- A hexagonal prism has a face of 32 mm^2 , a length of 11 mm, and a weight of 4.2 grams. What is its volume?
- A heart-shaped box of candy costs \$13.50. The lid has an area of 510 cm^2 . It is 5 cm deep. What is the volume?
 
- A top of a can is 99 cm^2 . The can is 12 cm tall. What is the volume?
- Dimensions of a rectangular box are 11 cm, 10 cm, and 21 cm. Find the volume.

352 mL or
 352 cm^3

2550 cm^3

1188 cm^3

2310 cm^3

Other Questions

11.

12.

Mental Math

Grade 8 Mathematics

A-49

Learning Target Volume (Capacity) (Shape and Space: 8.SS.4)

Strategies of Focus Using Compatible Numbers

Prior Learning

Solve questions 1 to 6 and indicate which numbers are easiest to start with.

1. $3 \times 25 \times 4 \times 7$

2. $12.5 \times 7 \times 2$

3. $103 + 89.7 + 3 - 89.7$

4. $84 \times 15 \times 419 \times 0 \times 12$

5. $6 \times 19 + 1$

6. $1 + 100 \div 4 \div 2$

Answers

2100 (start with
 25×4)

175
(12.5×2)

106
($89.7 - 89.7$)

0
(anything $\times 0$)

115 (don't forget
order of
operations)

13.5 (order of
operations)

Grade 8 Questions

7. Eleven identical boxes of nails have dimensions of $10 \text{ cm} \times 15 \text{ cm} \times 10 \text{ cm}$. What is the total volume of the boxes?

8. Four identical snowmobile trailers have dimensions of $3 \text{ m} \times 1\frac{1}{2} \text{ m} \times 2 \text{ m}$. What is the total volume of the trailers?

9. How much water would it take to fill 5 identical fish tanks with dimensions of $25 \text{ cm} \times 50 \text{ cm} \times 40 \text{ cm}$?

10. There are two Grade 8 classrooms at George Waters Middle School. There are 20 students in each class. How much hot chocolate needs to be prepared in order to give each student 250 mL?

$16\,500 \text{ cm}^3$

36 m^3

250 000 mL
(or cm^3) or 250 L

10 000 mL
or 10 L

Other Questions

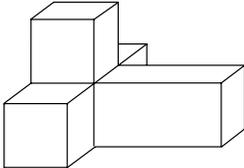
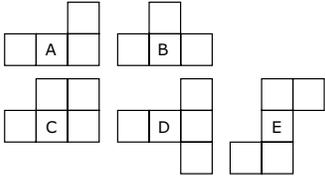
11.

12.

Mental Math

Grade 8 Mathematics

Learning Target	Identifying, Sorting, Comparing, and Constructing (Shape and Space: 8.SS.2, SS.5)
Strategies of Focus	Visualization

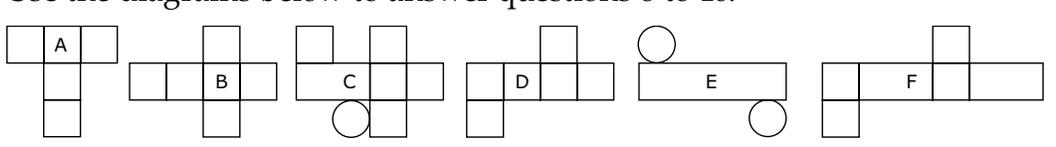
Prior Learning	Answers
1. How many faces does a cube have?	6 faces
2. How many edges does a triangular prism have?	9 edges
3. How many vertices does a cube have?	8 vertices
4. How many edges does a triangular pyramid have?	6 edges
5. How many vertices does a hexagon have?	6 vertices
6. How many faces does a square pyramid have?	5 faces
Grade 8 Questions	
<p>Use the diagram shown on the right to answer questions 7 to 10.</p> <div style="display: flex; align-items: center; justify-content: center; gap: 20px;">   </div>	
7. Which of the above lettered pictures represents a top view of the 3-D object?	D
8. Which of the above lettered pictures represents a side view of the 3-D object?	A and B
9. Which of the above lettered pictures does not represent a possible view of the 3-D object?	C and E
10. Which of the above lettered pictures represents an underside view of the 3-D object?	D
Other Questions	
11.	
12.	

Mental Math

Grade 8 Mathematics

A-51

Learning Target	Identifying, Sorting, Comparing, and Constructing (Shape and Space: 8.SS.2, SS.5)
Strategies of Focus	Visualization

Prior Learning	Answers
1. Which of the following are quadrilaterals? rectangle, octagon, rhombus, triangle	Rectangle and rhombus
2. Are all squares rectangles?	Yes
3. Are all rectangles squares?	No
4. Are all rhombuses squares?	No
5. Are all squares rhombuses?	Yes
6. Are all trapezoids quadrilaterals?	Yes
Grade 8 Questions	
7. Are all cubes rectangular prisms?	Yes
Use the diagrams below to answer questions 8 to 10.	
	
8. Which of the above nets can form a cube?	B and D
9. Which of the above nets can form a rectangular prism?	F
10. Which of the above nets can form a cylinder?	E
Other Questions	
11.	
12.	

Mental Math

Grade 8 Mathematics

A-52

Learning Target	Identifying, Sorting, Comparing, and Constructing (Shape and Space: 8.SS.2, SS.5)
Strategies of Focus	Memorization

Prior Learning

1. Does the triangle formed by the letter "A" form a scalene, isosceles, or equilateral triangle?
2. Are the four triangles formed by cutting a square across both of its diagonals acute, obtuse, or right triangles?
3. What will be the measure of each angle in an equilateral triangle?

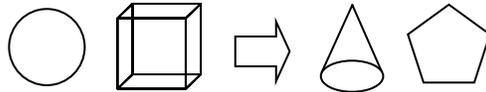
Answers

Isosceles

Right

60°

Use the diagrams shown on the right to answer questions 4 to 6.



4. Which of the above objects is an irregular polygon?
5. Which of the above is a prism?
6. Which of the above objects contains only obtuse angles?

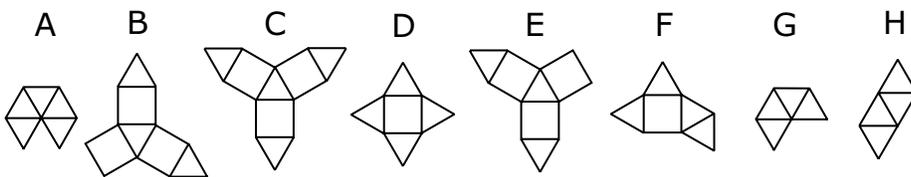
The arrow (heptagon)

The cube

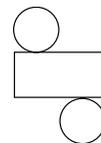
The pentagon

Grade 8 Questions

Use the diagrams below to answer questions 7 to 9.



7. Which of the above nets can create a square pyramid?
8. Which of the above nets can create a triangular prism?
9. Which of the above nets can create a triangular pyramid?
10. Will this net fold to form a cylinder? Why or why not?



D and F

None

H

No, the circumference of the circle is much longer than the side of the rectangle.

Other Questions

11.

12.

Mental Math

Grade 8 Mathematics

A-53

Learning Target	Position and Motion (Shape and Space: 8.SS.6)		
Strategies of Focus	Visualization		
Prior Learning		Answers	
Point B is (3, 1). Find the coordinates of point B' after completing the following individual transformations.			
1. 90° clockwise rotation around the origin		B' = (1, -3)	
2. 90° counter-clockwise rotation around the origin		B' = (-1, 3)	
3. 180° rotation around the origin		B' = (-3, -1)	
4. Reflection on the <i>x</i> -axis		B' = (3, -1)	
5. Reflection on the <i>y</i> -axis		B' = (-3, 1)	
6. Translation 3 units left and one unit down		B' = (0, 0)	
Grade 8 Questions			
7. Will an equilateral triangle tessellate the plane?		Yes	
8. Will an isosceles triangle tessellate the plane?		Yes	
9. Will a square tessellate the plane?		Yes	
10. Will a pentagon tessellate the plane?		No	
Other Questions			
11.			
12.			

Mental Math

Grade 8 Mathematics

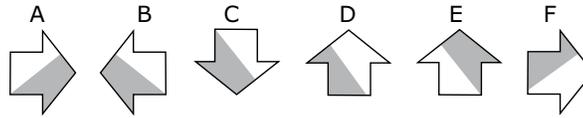
A-54

Learning Target Position and Motion (Shape and Space: 8.SS.6)

Strategies of Focus Visualization

Prior Learning

Use the diagrams shown on the right to answer questions 1 to 6.



- Which image represents a reflection of A?
- Which image represents a rotation of 90° counter-clockwise for A?
- Which image represents a rotation of 90° clockwise for A?
- Which image represents a transformation of F?
- Sketch a 180° rotation of F.
- Which images are not a transformation of B?

Answers

B

E

C

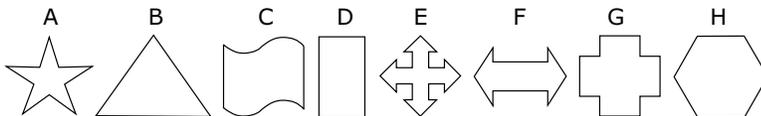
D



D and F

Grade 8 Questions

Use the diagrams shown below to answer questions 7 to 10.



- True or False: A and B can be combined to tessellate the plane.
- True or False: Both C and D can individually tessellate the plane.
- True or False: E and F can be combined to tessellate the plane.
- True or False: G and H tessellate the plane because the measure of each of their angles is a factor of 360.

False

True

False

True

Other Questions

11.

12.

Mental Math

Grade 8 Mathematics

A-55

Learning Target	Collection, Organization, and Analysis of Data (Statistics and Probability: 8.SP.1)
Strategies of Focus	Various

Prior Learning

The following weights were bench-pressed by a group of Grade 8 students: 32 kg, 41 kg, 15 kg, 22 kg, and 15 kg. Answer questions 1 to 4.

- Find the mean.
- Find the mode.
- Find the median.
- What would be an appropriate graph to use to show this information?
- Is the height of a child, measured every month for the course of three years, continuous or discrete data?
- A survey asked the question, "Do you prefer eating fresh food at Jimmy's Restaurant or eating stale food at home?" Is this a fair survey question?

Answers

25 kg

15 kg

22 kg

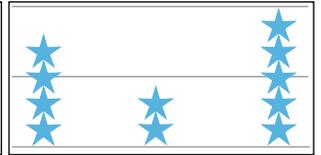
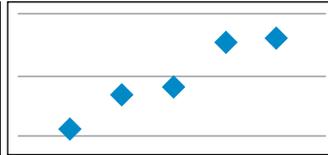
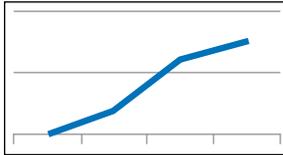
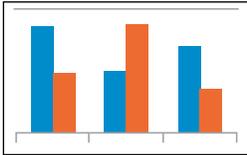
Bar graph or pictograph

Continuous

No, it is biased and provides limited survey options.

Grade 8 Questions

Use the following graphs to answer questions 7 to 10.



- Why would a dot graph better show money earned at a lemonade stand every day than a line graph?
- Which type of graph would best show height comparisons between boys and girls among different grades?
- Which graph would best show percentage of daily time used for different activities?
- Which graph would best show the distance someone travelled over the course of a day?

Dots show discrete data.

Double-bar graph

Pie chart

Line graph

Other Questions

11.

12.

Mental Math

Grade 8 Mathematics

A-56

Learning Target	Collection, Organization, and Analysis of Data (Statistics and Probability: 8.SP.1)
Strategies of Focus	Various

Prior Learning

For questions 1 to 3, answer the following question: "Is the following information first-hand or second-hand data?"

1. You circulate a survey to find out what movies your friends would like to see.
2. You look up your favourite hockey player's stats online.
3. You use information from a graph published in the *Daily Graphic* newspaper.

For questions 4 to 6, answer the following question: "What would be the most appropriate method of collecting the following data?"

4. You want to know the average income of Canadian adults.
5. You want to know the average running speed of the students in your class.
6. You want to know the favourite foods of your friends.

Answers

First-hand

Second-hand

Second-hand

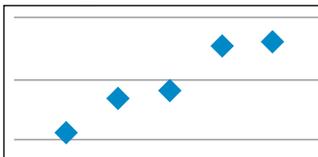
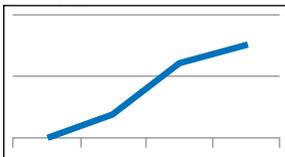
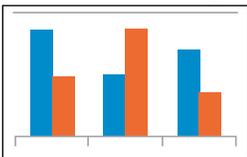
Consult a database

Experiment

Survey

Grade 8 Questions

Select the best graph type for each of the titles given in questions 7 to 10.



7. "Goals Scored by the Top Three Grade 8 Soccer Players This Month"
8. "Favourite Soccer Positions in Grade 8: Forward, Mid, Defence, or Goal"
9. "Season Wins and Losses for Three Teams"
10. "Number of Victories Over the Last Five Months"

Pictograph

Pie chart

Double-Bar graph

Dot graph

Other Questions

11.

12.

Mental Math

Grade 8 Mathematics

A-57

Learning Target Probability (Statistics and Probability: 8.SP.2)

Strategies of Focus Various

Prior Learning

Answers

1. A bag has 8 blue marbles, 5 red marbles, and 7 green marbles. What is the probability, as a percent, of drawing a green marble?
2. What is the probability, as a reduced fraction, of drawing a red marble?
3. What is the probability, as a ratio to all possibilities, of drawing a blue marble?
4. Can the probability of something occurring ever be greater than 100%?
5. If the probability of rain in Brandon is 40%, what is the probability that it won't rain?
6. What is the probability of rolling a seven on a regular six-sided die?

35%

$\frac{1}{4}$

2:5

No

60%

0%

Grade 8 Questions

7. A coin is tossed and a six-sided die is rolled. What is the probability of tossing a heads and rolling a 4?
8. What is the probability of rolling a 6 twice in a row on a six-sided die?
9. What is the probability of getting 2 true or false questions correct with random guesses?
10. What is the probability of getting 2 true or false questions both wrong with random guesses?

1 out of 12

1 out of 36

1 out of 4

1 out of 4

Other Questions

11.

12.

Mental Math

Grade 8 Mathematics

A-58

Learning Target Probability (Statistics and Probability: 8.SP.2)

Strategies of Focus Distribution

Prior Learning

1. Calculate: 64% of 25
2. Calculate: 25% of 64
3. Calculate: 42% of 20
4. Calculate: 20% of 42
5. Calculate: 41% of 50
6. A baseball player has a 20% probability of hitting the ball. This player has 15 opportunities to hit. How many hits should be expected?

Answers

16

16

8.4

8.4

20.5

3 hits

Grade 8 Questions

7. What is the probability of rolling an even number twice in a row on a six-sided die?
8. There is an 80% chance of rain in Winnipeg, a 10% chance of rain in Portage, and a 25% chance of rain in Thompson all on the same day. What is the probability of rain occurring in all three cities?
9. A multiple choice test has questions with options of a, b, c, or d. What is the probability of getting two questions correct with random guesses?
10. What is the probability of getting these same two questions wrong?

1 out of 4

2% chance of rain in the three cities

1 out of 16

9 out of 16

Other Questions

11.

12.