Mental Math

Grade 11 Essential Mathematics (30S)

E–1

Unit E: Relations and Patterns **Specific Learning Outcome: 11.E4.R.1**

General Questions	Answers
1. Solve: $2h - 5 = 17$	$h = 11$
2. Solve: $\dfrac{m}{6} = \dfrac{9}{54}$	$m = 1$
3. Evaluate and reduce to lowest terms: $\dfrac{7}{4} \times \dfrac{2}{7}$	$\dfrac{1}{2}$
4. Complete the pattern: 1, 4, 9, 16, _____ , _____	25, 36
5. Samia has four brothers. Her parents had four sons and one daughter. How many sisters does Samia have?	None

Unit Questions

Use the following information to answer questions 6 to 8. The chart shows the size (ounces) and the cost (dollars) of Tom Houston's coffee.

Size	8	12	16	20
Cost		1.79	1.99	2.19

	Answers
6. State the dependent variable for the relationship of the size of a Tom Houston's coffee compared to the cost.	Coffee cost (depends on coffee size)
7. Assuming the relationship is linear, predict the cost of an 8-ounce coffee.	$1.59
8. How much would an extra-large, 24-ounce Tom Houston's coffee cost?	$2.39

Other Questions

9.

10.

Mental Math

E–2

Grade 11 Essential Mathematics (30S)

Unit E: Relations and Patterns　　　　**Specific Learning Outcome: 11.E4.R.5**

General Questions	Answers
1. Complete the pattern: 1, 1, 2, 3, 5, 8, _____ , _____	13, 21
2. A computer costs $500. Find the cost including taxes (PST = 7%, GST = 5%).	$560
3. If 10% of a number is 36, then 25% of the number is _____ .	90
4. Evaluate and reduce your answer if possible: $\dfrac{2}{5} + \dfrac{8}{15}$	$\dfrac{14}{15}$
5. There are three available cubicles in a row at an office for Sam, Xan, and Laura. Sam won't sit next to Xan. Can Sam sit in the middle cubicle?	No, the middle cubicle is beside Xan.

Unit Questions

Use the 4 patterns shown to answer questions 6 to 8.

Pattern A	17, 13, 9, 5, . . .
Pattern B	1, 4, 9, 16, . . .
Pattern C	3, 6, 9, 12, . . .
Pattern D	1, 2, 3, 5, . . .

	Answers
6. Which patterns above demonstrate a linear relationship?	A and C
7. For Pattern A, what is the rate of change of the pattern number as the term number goes up by 1?	−4
8. Predict the next number in sequences B and C.	B = 25 C = 15

Other Questions

9.

10.

Mental Math

Grade 11 Essential Mathematics (30S)

E–3

General Questions	Answers
1. Solve the following: $5 - \dfrac{4 \times 5}{2} + 8$	*3*
2. Write two equivalent fractions with smaller denominators: $\dfrac{20}{8}$	$\dfrac{10}{4}$ and $\dfrac{5}{2}$
3. At a street vendor, hot dogs cost $4, pop costs $1.50, and chips cost $2.00. You have $6 in your pocket. Will you be able to buy one of each item?	No
4. Which month can have a whole number of weeks (no decimal or fraction)?	February
5. Solve: $\dfrac{8}{r} = 2$	$r = 4$

Unit Questions	
Use the following information to answer questions 6 to 8. John is building a deck that costs $3 per square foot. The cost (*C*) is dependent on the size in square feet (*s*). The formula is *C* = 3*s*.	
6. If the size of the deck is 200 sq. ft., how much will it cost to build the deck?	$600
7. If John spends $1200, how big is the deck?	400 sq. ft.
8. If John builds a 150 sq. ft. section and a 450 sq. ft. section, how much will the two-part deck cost?	$1800

Other Questions	
9.	
10.	

Mental Math

Grade 11 Essential Mathematics (30S)

E–4

Unit E: Relations and Patterns	Specific Learning Outcome: 11.E4.R.1

General Questions	Answers
1. Solve: $\dfrac{10}{d} = 20$	$d = \dfrac{1}{2}$
2. Sara has five nickels in her pocket; Damian has one quarter. Who has more money?	They have the same amount.
3. Kudus got 75% on his final exam in science. If the exam is worth 40% of his total grade, how many marks does his exam count toward his total grade?	30 marks
4. Elyce went to the grocery store to buy food for dinner. The total cost was $45.30 and she gave the cashier three $20 bills. How much change should she receive?	$14.70
5. A checkerboard alternates black and white squares. If a checkerboard is 8 squares wide by 8 squares long, how many squares are black?	32

Unit Questions

Use the graph to answer questions 6 to 8.

Car Speed

Distance Travelled (km) vs Time (min.)

Points: A, B, C, D
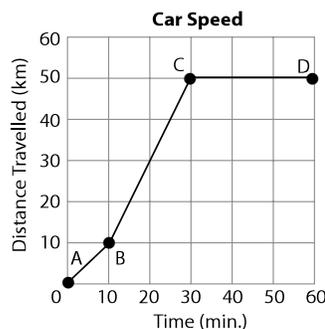
6. What is the slope of line segment AB (from point A to point B)?	1 km/min.
7. What is the slope of line segment BC?	2 km/min.
8. What is the slope of line segment CD?	0 km/min.

Other Questions

9.

10.

Mental Math

Grade 11 Essential Mathematics (30S)

E–5

Unit E: Relations and Patterns　　　　**Specific Learning Outcome: 11.E4.R.1**

General Questions	Answers
1. 10 cm = _____ m	0.1 m
2. 12 ft. = _____ yd.	4 yd.
3. 15 s = _____ min.	0.25 min.
4. 0.53 km = _____ m	530 m
5. 1.5 ft. = _____ in.	18 in.

Unit Questions

Use the following information to answer questions 6 to 8. Ares is an old dog with joint problems. His owner decides to build him a ramp over the front steps.
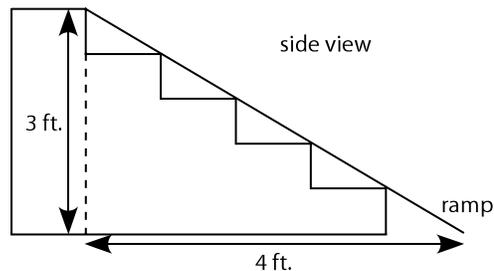
6. What is the slope of the ramp as a fraction and as a decimal?	$\dfrac{3}{4} = 0.75$
7. What is the length of the ramp? **Hint:** $c^2 = a^2 + b^2$.	5 ft.
8. If the width of the ramp is 2 ft., what is the area of the rectangular ramp?	10 ft.^{2}

Other Questions

9.

10.

Mental Math

Grade 11 Essential Mathematics (30S)

E–6

Unit E: Relations and Patterns   **Specific Learning Outcome: 11.E4.R.2/R.3**

General Questions	Answers
1. The volume of a 2 by 2 by 2 cube is 8 units. How many times larger is the volume of a cube with dimensions 4 by 4 by 4?	8
2. Complete the pattern: 4, _____ , 16, 32, _____	8 and 64
3. There are 30 days in September, 31 days in October, 30 days in November, and 31 days in December. How many days are there between, but not including, September 1st and New Year's Eve?	120
4. How many cm^2 are equal to 310 m^2?	3 100 000
5. Evaluate: $\dfrac{4}{9} \times \dfrac{1}{2}$	$\dfrac{2}{9}$

Unit Questions

Use the following information below to answer questions 6 to 8. Indra is testing out the brakes on her golf cart. The graph shows her distance from the clubhouse as a function of time.

Golf Cart Brake Test
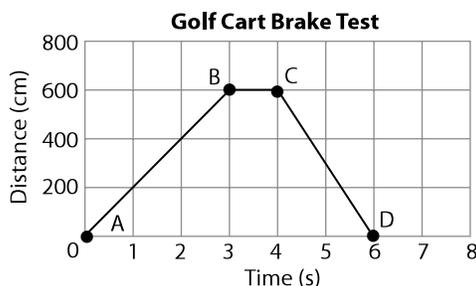
6. Find the speed of the golf cart in cm/s during line segment AB (from point A to point B).	200 cm/s
7. What is the speed of the golf cart in m/s for line segment AB? **Hint:** 100 cm = 1 m	2 m/s
8. What is the speed of the golf cart in m/s for line segment CD?	−3 m/s or 3 m/s back to clubhouse

Other Questions

9.

10.

Mental Math

Grade 11 Essential Mathematics (30S)

E–7

Unit E: Relations and Patterns	Specific Learning Outcome: 11.E4.R.2

General Questions	Answers
1. How many hours are in 3 days?	72
2. Estimate 13% of $39.12.	≈ $5.10 or $5.20
3. If 8 students in a geometry class of 30 students can find Laos on a map, what is the fraction of the class that can find Laos on a map?	$\frac{8}{30}$
4. Evaluate: 25×16	400
5. What is the complementary angle to 45˚?	45°
Unit Questions	
6. Convert 1500 m to km. (**Hint:** 1000 m = 1 km)	1.5 km
7. Convert 20 m/s to km/h. (**Hint:** 3600 s = 1 h)	72 km/h
8. Convert 36 km/h to m/s.	10 m/s
Other Questions	
9.	
10.	

Mental Math

Grade 11 Essential Mathematics (30S)

E–8

Unit E: Relations and Patterns   **Specific Learning Outcome: 11.E4.R.4**

General Questions	Answers
1. Simon says that in five years, his dad will be double Simon's age. If Simon's dad is 43, how old is Simon?	19
2. You spent a total of $300 on 25 pizzas. How much did each pizza cost?	$12
3. How many minutes are in a day?	1440
4. What is 10% of 43?	4.3
5. It is January 18th. In 14 days, what will the date be?	February 1

Unit Questions

Use the following information to answer questions 6 to 8. Mrs. Dill is visiting another school in Snow River. She rents a car to get to the school and back to the airport.

1 cm
1.5 cm
2 cm
1 cm : 150 km

Legend
- Airport
- School
- Gas Service
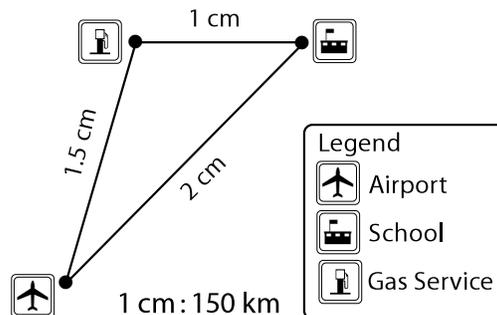
6. What is the real distance in kilometres from the airport to the school and then to the gas station?	450 km
7. What is the real distance in kilometres from the airport to the gas station and then to the school?	375 km
8. The rental car has a full tank of gas that will go 425 kilometres before it needs refilling. How many times does Mrs. Dill need to get gas?	Twice (airport to school is too far)

Other Questions

9.	
10.	