



GRADE 9 MATHEMATICS (10F)

Final Practice Examination

Answer Key

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Instructions

The final examination will be weighted as follows

Modules 1–4	25%
Modules 5–8	75%

The format of the examination will be as follows:

Part A: Multiple Choice	22 x 2 = 44 marks
Part B: Short Answer	28 marks
Part C: Long Answer	28 marks

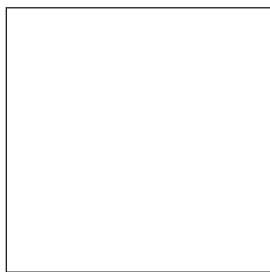
Time allowed: 2 hours

Supplies: pen, pencil, paper, scientific calculator, protractor, ruler

Note: See following page for instructions regarding use of algebra tiles.

The questions on this practice exam are similar to the questions you will see on your final exam. If there are any questions that you do not understand, look in the lesson where the material is taught, and ask your tutor/marker or learning partner to help you.

Use the following representations for algebra tiles.



$= -x^2$



$= x^2$



$= -x$



$= x$



$= -1$



$= 1$

Part A: Multiple Choice (22 x 2 = 44 Marks)

Circle the letter of the response that represents the correct answer.

1. When you roll a 6-sided cube, numbered 1 to 6, the probability of rolling a 2 is $\frac{1}{6}$. This is an example of:
- a) an experimental probability
 - b) theoretical probability**
 - c) subjective reasoning
 - d) assumption

You have 6 options $\Rightarrow \frac{1}{6}$.

It is theoretical because this probability is based on logic, not data.

(Module 6, Lesson 1)

2. An image rotated around its centre point appears unchanged after 180° and 360° turns. This is an example of:
- a) line symmetry
 - b) rotation symmetry**
 - c) tessellation
 - d) vertex

(Module 8, Lesson 3)

3. You survey people as they leave a Blue Bomber game and ask them to identify their favourite sport. The potential problems or bias in data is caused by:
- a) cultural insensitivity
 - b) cost concerns
 - c) ethical behaviour
 - d) time and timing**

(Module 1, Lesson 3)

4. Given the following pattern of shapes, choose the mathematical expression showing the changes for each iteration if b is the number of boxes in the previous iteration.



- a) $b + 1$
- b) $b + 2$**
- c) $b - 1$
- d) $b - 2$

(Module 5, Lesson 2)

5. Add: $\frac{3}{4} + \frac{1}{2} =$

a) $1\frac{1}{4}$

b) $\frac{5}{4}$

c) neither (a) nor (b) above

d) **both (a) and (b) above**

$$1\frac{1}{4} = \frac{4}{4} + \frac{1}{4} = \frac{5}{4}$$

(Module 2, Lesson 3)

6. Your income (I) is compared to the number of hours (H) you work. The variable, I, would

a) **be the dependent variable**

b) be the independent variable

c) be constant

d) go on the y -axis

(Module 5, Lesson 3)

7. Give the base of the following power: -3^4 .

a) **3**

b) -3

c) -12

d) -81

The negative is not **inside** the brackets, so it is the same as writing -1×3^4 .

(Module 3, Lesson 2)

8. An inscribed angle has a measurement of 75° . A central angle shares the same endpoints. What is the measurement of the central angle?

a) 375°

b) 75°

c) **150°**

d) 225°

(Module 6, Lesson 3)

9. When simplified, what is the exponential form of the following expression: $3^4 * 3^5 * 3^6$?

a) **3^{15}**

b) 3^{120}

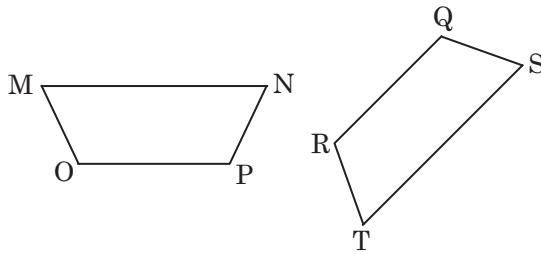
c) 9^{15}

d) 27^{15}

With like bases, you **add** the exponents when multiplying powers.

(Module 3, Lesson 5)

10. If shapes MOPN and SQRT are similar, which proportion is true?



- a) $\frac{MO}{RT} = \frac{MN}{RQ}$
 b) $\frac{MO}{RT} = \frac{OP}{TS}$
 c) $\frac{NP}{QS} = \frac{OP}{TS}$
 d) $\frac{MN}{ST} = \frac{MO}{SQ}$

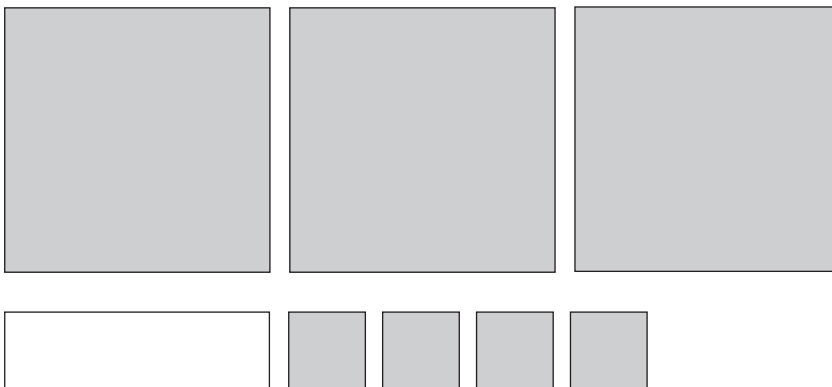
(Module 7, Lesson 3)

11. A box of oranges costs \$2.25. Which equation would represent the total cost, C , of any number, n , of boxes of oranges?

- a) $C = 2.25 + n$
 b) $C = 2.25 - n$
 c) $C = 2.25n$
 d) $C = \frac{2.25}{n}$

(Module 5, Lesson 3)

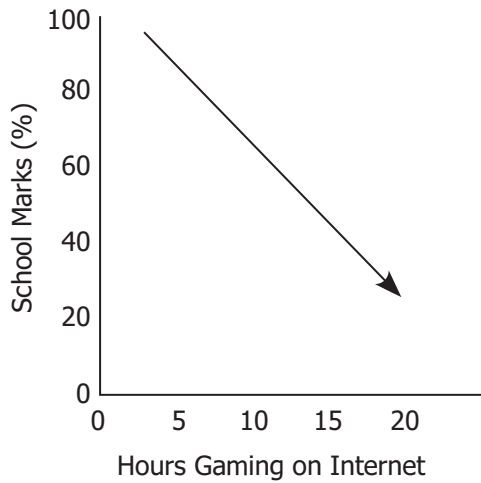
12. An expression representing this arrangement of tiles is:



- a) $-3x^2 + x - 4$
 b) $-3x^2 - x + 4$
 c) $3x^2 - x - 4$
 d) $3x^2 - x + 4$

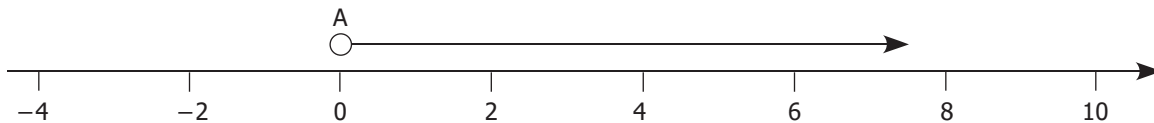
(Module 4, Lesson 2)

13. Choose a sentence that describes in words what this graph is showing.



- a) increased hours gaming on the Internet increases school marks
- b) school marks decline based on increased hours gaming on the Internet**
- c) hours gaming on the Internet do not affect school marks
- d) no hours gaming on the Internet guarantees you 100% (Module 5, Lesson 2)

14. This inequality is read as:



- a) values less than 0
- b) values less than or equal to 0
- c) values greater than 0**
- d) values greater than or equal to 0

Because the arrow is pointing to the larger numbers, it is greater than. Because the point is **not filled**, it is not equal to 0.

(Module 5, Lesson 6)

15. Give the next value in the following pattern: 120 90 60 _____

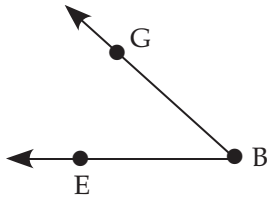
- a) 50
- b) 30**
- c) 80
- d) 0.3

The pattern is to subtract 30 each time.

(Module 5, Lesson 2)

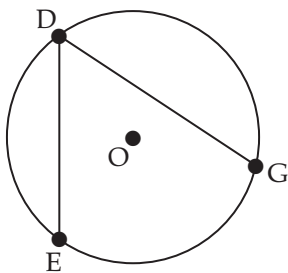
16. An inscribed angle that subtends, or has the same endpoints as a semicircle, will measure:
- a) half of 90°
 - b) 90°**
 - c) double the measure of the semicircle
 - d) 180°
- (Module 6, Lesson 3)

17. Find the measure of the angle below, using your protractor.



- a) $42^\circ \pm 3$**
 - b) $52^\circ \pm 3$
 - c) $32^\circ \pm 3$
 - d) $48^\circ \pm 3$
- (Module 6, Lesson 2)

18. $\angle EDG$ in this diagram is an example of a(n):



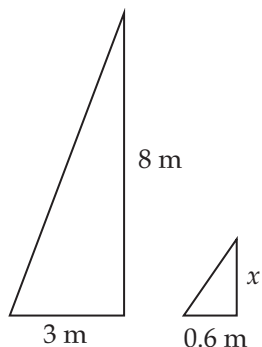
- a) right angle
 - b) central angle
 - c) perpendicular bisector
 - d) inscribed angle**
- (Module 6, Lesson 2)

19. The formula for finding the circumference of a circle is:

- a) $2\pi r$
- b) πr^2
- c) $\frac{b_1 + b_2}{2}$
- d) $\frac{bh}{2}$

(Module 7, Lesson 2)

20. If these shapes are similar, what is the value of x ?



- a) 4 m
- b) 1.6 m**
- c) 1.8 m
- d) 18 m

(Module 7, Lesson 3)

21. Similar figures have:

- a) proportional sides and identical angles**
- b) proportional sides and angles
- c) equal sides and proportional angles
- d) sides that look the same

(Module 7, Lesson 3)

22. An object that repeats itself every 120° of rotation has rotation symmetry of order:

- a) 0
- b) 1
- c) 3**
- d) 4

(Module 8, Lesson 3)

Part B: Short Answer (28 Marks)

Answer the following questions. Show all work.

1. Solve $4m - 2 = 5m + 7$ by isolating the variable. (2 marks)

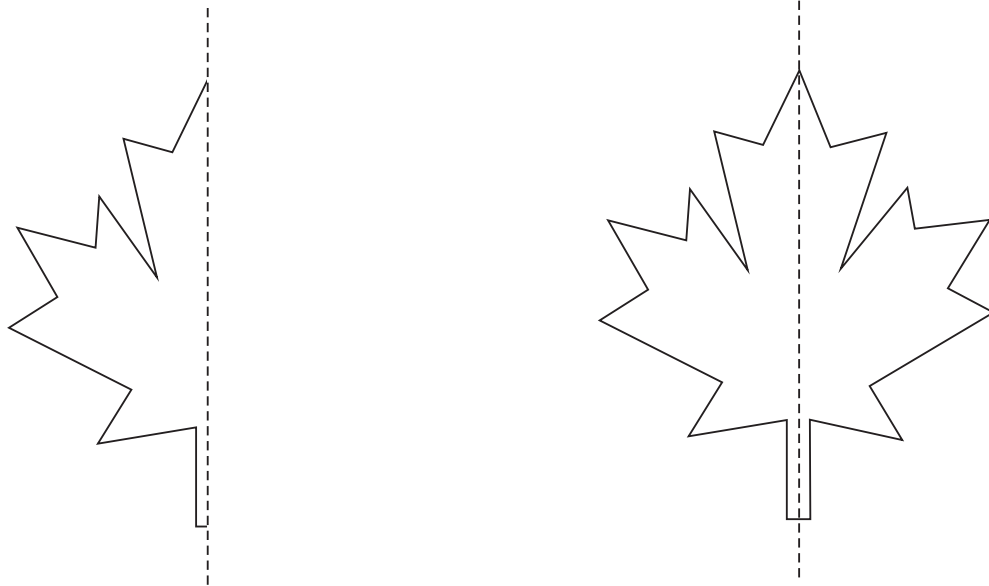
Answer:

$$\begin{aligned}4m - 2 - 4m &= 5m + 7 - 4m \\-2 &= m + 7 \\-2 - 7 &= m + 7 - 7 \\m &= -9\end{aligned}$$

(Module 5, Lesson 5)

2. Draw the reflected half across the line of symmetry. (2 marks)

Answer:



(Module 8, Lesson 2)

3. You have a square tarp to cover your boat. The area of the tarp is 49 m^2 . Find the length of one side. (2 marks)

Answer:

7 m

(Module 7, Lesson 2 and
Module 2, Lesson 5)

4. Fill in the empty spots. (6 marks)

Term	Base	Exponent	Power
2^5	2		
$(-4)^3$		3	$(-4)^3$
26^7			26^7
-3^6		6	-3^6

Answer:

Term	Base	Exponent	Power
2^5	2	5	2^5
$(-4)^3$	(-4)	3	$(-4)^3$
26^7	26	7	26^7
-3^6	3	6	-3^6

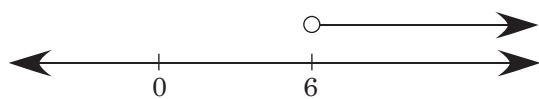
(Module 3, Lesson 2)

5. Solve for g and graph your solution on a number line. (2 marks)

$$4g - 6 > 3g$$

Answer:

$$g > 6$$



(Module 5, Lesson 6)

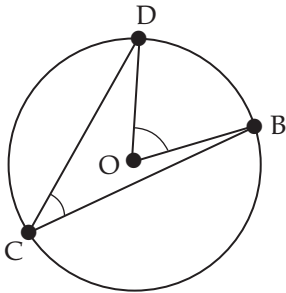
6. When comparing profits to sales, identify which is the dependent variable, and explain why it is dependent. (4 marks)

Answer:

The profits are the dependent variable because how much you sell determines your profit. Lower sales lessen the profit, higher sales increase the profit.

(Module 5, Lesson 4)

7. Use your protractor to find the measurement of both $\angle DCB$ and $\angle DOB$ in the following diagram. (4 marks)



Answer:

$$\angle DOB = 70^\circ \pm 3$$

$$\angle DCB = 35^\circ \pm 3$$

(Module 6, Lesson 2)

8. The length of the highway from Calgary to Vancouver is almost 1000 km. If you use a scale factor of 1 cm : 75 km, how long would the line representing this distance be on your drawing? (4 marks)

Answer:

$$1 \text{ cm} : 75 \text{ km}$$

$$x : 1000$$

$$x = 13.3 \text{ cm}$$

(Module 7, Lesson 5)

9. Describe the difference between the solution for $4m = -28$ and $4m \leq -28$. (2 marks)

Answer:

The solution to $4m = -28$ is $m = -7$ while the solution to $4m \leq -28$ is all real numbers less than or equal to -7 . $4m \leq -28$ has an infinite number of solutions while $4m = -28$ has only one solution.

(Module 5, Lesson 7)

Part C: Long Answer (28 Marks)

Solve each of the following problems. Show all your work, and include written explanations where necessary.

1. You want to determine the most common paint colour of cars and trucks in your town. Explain in detail how you would collect these data, and discuss why you chose that method. (4 marks)

Answer:

Make observations on various roads at various times.

Various roads to cover the most number of drivers, and different times to get shift workers.

I could also cruise around parking lots to collect data (quicker).

(Module 1, Lesson 7)

2. Place the following rational numbers in order from smallest to largest. (3 marks)

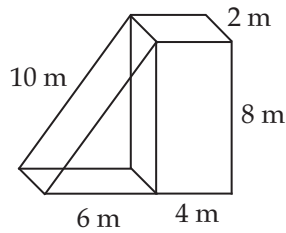
$$\frac{5}{7} \quad -0.25 \quad \frac{-1}{3} \quad 0.001 \quad -0.01 \quad \frac{3}{4} \quad \frac{-2}{5}$$

Answer:

$$0.714 \quad -0.25 \quad -0.333 \quad 0.001 \quad -0.01 \quad 0.75 \quad -0.4$$
$$\frac{-2}{5} \quad \frac{-1}{3} \quad -0.25 \quad -0.01 \quad 0.001 \quad \frac{5}{7} \quad \frac{3}{4}$$

(Module 2, Lesson 4)

3. Find the surface area of the following composite object. (4 marks)



Answer:

Rectangular Prism:

$$2 \times 4 \times 8 + 2 \times 4 \times 2 + 2 \times 8 \times 2 = 112 \text{ m}^2$$

Triangular Prism:

$$2 \times \frac{1}{2} \times 6 \times 8 + 10 \times 2 + 6 \times 2 + 2 \times 8 = 96 \text{ m}^2$$

Overlap:

$$8 \times 2 \times 2 = 32$$

Total:

$$112 + 96 - 32 = 176 \text{ m}^2$$

(Module 7, Lesson 3)

4. You are working at a summer job to save money for the family winter trip to Florida. You want to have at least \$500 saved. If your wage is \$9.50 an hour, use a mathematical expression to find the minimum number of hours you will need to work to have enough money saved. (3 marks)

Answer:

Let h = money earned per hour

$$9.50h \geq 500$$

$$\frac{9.50h}{9.50} \geq \frac{500}{9.50}$$

$$h \geq 52.6$$

Since you work only full hours, you need to work 53 hours to earn at least \$500.

(Module 5, Lesson 7)

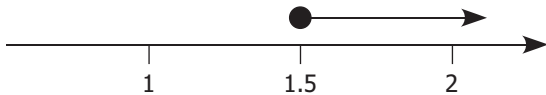
5. Isolate the variable, and draw a number line showing the solution to the following inequality. (4 marks)

$$6h + 4 \geq -2h + 16$$

Answer:

$$8h \geq 12$$

$$h \geq \frac{3}{2}$$



(Module 5, Lesson 5)

6. Given the following diagram, identify the listed components. (6 marks)

a) 2 radii _____

b) tangent _____

c) 3 chords _____

Answer:

2 radii OA

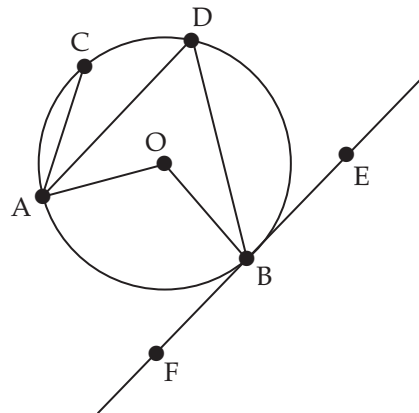
OB

tangent FE

3 chords AC

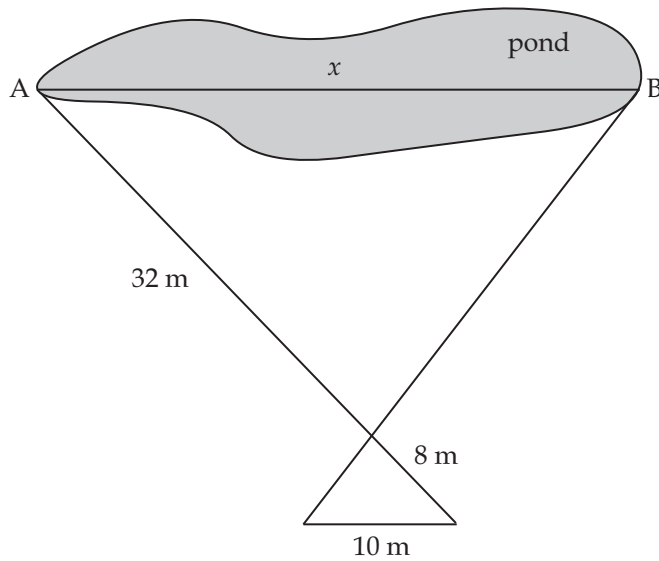
AD

BD



(Module 6, Lesson 2)

7. Use proportions based on the similar triangles below to find the distance across the pond from A to B. (4 marks)



Answer:

$$\frac{32}{x} = \frac{8}{10}$$
$$(10x) \frac{32}{x} = \frac{8}{10} (10x)$$
$$320 = 8x$$
$$40 = x$$

The pond is 40 m long.

(Module 7, Lesson 4)

NOTES