



GRADE 9 MATHEMATICS (10F)

Midterm Practice Examination

Answer Key

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Instructions

The midterm examination will be weighted as follows

Modules 1–4	100%
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The format of the examination will be as follows:

Part A: Multiple Choice	15 x 1 = 15 marks
Part B: Short Answer	9 x 3 = 27 marks
Part C: Problem Solving	58 marks

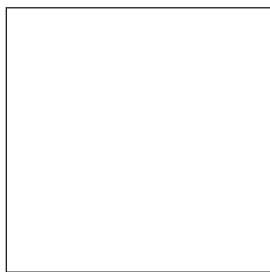
Time allowed: 2 hours

Notes: You are allowed to bring the following to the exam: pen, pencil, paper, scientific calculator, and your Midterm Exam Resource Sheet. Your Midterm Exam Resource Sheet must be handed in with the exam. You will receive your Midterm Exam Resource Sheet back from your tutor/marker with the next module work that is submitted for marking.

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 midterm 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 (15 x 1 mark each = 15 Marks)

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

1. A method of collecting data is:
 - a) telephone survey
 - b) mail-in replies
 - c) observation
 - d) **all of the above** (Module 1, Lesson 2)

2. Statisticians use charts and graphs to illustrate data because:
 - a) they are less expensive
 - b) many people can't read
 - c) they like the colours
 - d) **they quickly show comparisons and trends** (Module 1, Lesson 5)

3. Surveying teachers about what teenagers like is biased because:
 - a) teachers are smart
 - b) schools have too many rules
 - c) **teachers may not know what teenagers like** (Module 1, Lesson 3)
 - d) only parents know what teenagers like

4. When subtracting fractions:
 - a) invert the second fraction and multiply
 - b) multiply by 10
 - c) **find a common denominator, and subtract the numerators** (Module 2, Lesson 3)
 - d) bottom number divided by the top number

5. Which of the following decimal numerals is equivalent to $\frac{5}{8}$?
 - a) **0.625** (Module 2, Lesson 4)
 - b) 0.58
 - c) 58
 - d) 62.5

6. 20% is equivalent to:

a) $\frac{20}{100}$ and 0.8

b) $\frac{10}{50}$ and 0.4

c) $\frac{1}{5}$ and 0.20

d) $\frac{1}{5}$ and 20

(Module 2, Lesson 4)

7. The quotient of $\frac{7^{10}}{7^2}$ is:

a) 7^{12}

b) 7^8

c) 7^{20}

d) 7^5

(Module 3, Lesson 5)

8. The simplified answer to $(-2 \cdot 3^5)^3$ is:

a) $-6 \cdot 3^8$

b) $6 \cdot 3^8$

c) $8 \cdot 3^{15}$

d) $-8 \cdot 3^{15}$

(Module 3, Lesson 4)

9. Simplify: $-3x^2 + 3x - 2x - 2x^2$

a) $5x^2 + x$

b) $5x^2 - x$

c) $-5x^2 + x$

d) $-5x^2 - 2x$

(Module 4, Lesson 3)

10. Which expression is indicated by the following tiles?



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

(Module 4, Lesson 2)

11. When you divide $(-9w + 6)$ by (-3) , the answer is:

- a) $3w - 2$
- b) $-6w + 3$
- c) $6w - 18$
- d) $-3w - 2$

(Module 4, Lesson 6)

12. When simplified, $(5p^2 - 2p - 3) - (-3p^2 + p - 4)$ is:

- a) $2p^2 - p + 1$
- b) $2p^2 - 3p - 1$
- c) $8p^2 - p + 1$
- d) $8p^2 - 3p + 1$

(Module 4, Lesson 4)

13. When adding $\frac{5}{9} + \frac{4}{5}$, the proper first step would be:

a) $\frac{5+4}{9+5}$

b) $\frac{5 * 5}{9 * 4} + \frac{4 * 9}{5 * 5}$

c) $\frac{5 * 5}{9 * 5} + \frac{4 * 9}{5 * 9}$

d) $\frac{5 * 5}{9 * 5} + \frac{4 * 5}{5 * 5}$

(Module 2, Lesson 3)

14. Which of the following illustrates the correct use of the distributive property for $-5v(4v - 6) + 2v(-5v - 6)$?

a) $-5v(4v) - 5v(-6) + 2v(-5v) + 2v(-6)$

b) $-5v(4v) + 5v(-6) + 2v(-5v) + 2v(6)$

c) $5v(4v) - 5v(6) + 2v(5v) + 2v(-6)$

d) $-5v(4v) - 5v(-6) - 5v(-5v) - 5v(-6)$

(Module 4, Lesson 4)

15. Which of the following indicates the correct first step when dividing: $\frac{5}{9} \div \frac{3}{5}$?

a) $\frac{4}{5} * \frac{3}{5}$

b) $\frac{9}{5} \div \frac{3}{5}$

c) $\frac{5}{9} * \frac{5}{3}$

d) $\frac{5}{9} \div \frac{5}{3}$

(Module 2, Lesson 3)

Part B: Short Answer (9 x 3 marks each = 27 Marks)

Answer the following questions. Show all work.

1. Write $\frac{(3)^5}{(3)^3}$ in expanded notation, and find the value.

Answer:

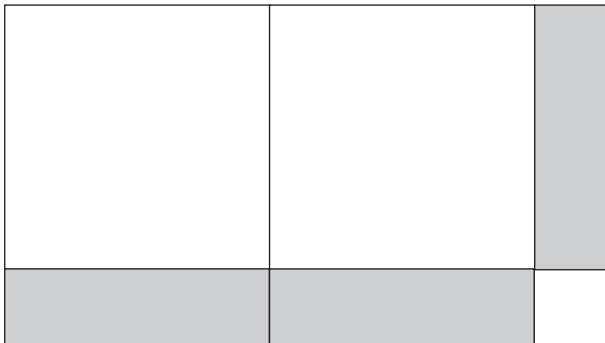
$$\frac{\cancel{(3)} \cancel{(3)} \cancel{(3)} (3)(3)}{\cancel{(3)} \cancel{(3)} \cancel{(3)}} = 3^{5-3} = (3)^2 = 9$$

(Module 3, Lesson 2)

2. Illustrate using algebra tiles this expression: $-2x^2 + 3x - 1$.

Answer:

Arrangement may vary.



(Module 4, Lesson 2)

3. A new car is worth \$24 000, but it decreases in value by 30% after one year. Find the value of the car after one year.

Answer:

$$\$24\,000 * 0.3 = 7200$$

$$\$24\,000 - 7200 = \$16\,800$$

(Module 2, Lesson 4)

4. List at least three potential problems with the following statistical statement.

“70% of Winnipeg taxpayers would like an NHL team”

Answer:

Answers may vary.

We don't know what question was posed or how the data were collected.

Was there any incentive offered?

Who did they ask?

It doesn't say if they would be willing to pay for it. (Module 1, Lesson 3)

5. Place these rational and decimal numerals in order from least to greatest.

$$\frac{2}{5} \quad -0.39 \quad \frac{3}{7} \quad -\frac{3}{8} \quad -\frac{2}{5}$$

Answer:

$$-\frac{2}{5} \quad -0.39 \quad -\frac{3}{8} \quad \frac{2}{5} \quad \frac{3}{7} \quad \text{(Module 2, Lesson 4)}$$

6. Divide the powers, and show your work.

$$\frac{(-3)^{10}}{(-3)^6}$$

Answer:

$$\frac{(-3)^{10}}{(-3)^6}$$

$$= (-3)^{10-6}$$

$$= (-3)^4$$

$$= 81 \quad \text{(Module 3, Lesson 5)}$$

7. Divide. Show all your steps.

$$\frac{3}{4} \div \frac{4}{5}$$

Answer:

$$\frac{3}{4} * \frac{5}{4}$$

$$= \frac{15}{16}$$

(Module 2, Lesson 3)

8. List 2 perfect square numbers between the following values.

$$82 \quad \underline{\hspace{2cm}} \quad \underline{\hspace{2cm}} \quad 125$$

Answer:

$$100 \quad 121$$

(Module 2, Lesson 5)

9. Show how you would estimate the approximate square root of 69 without using a calculator:

Answer:

$$\sqrt{64} = 8 \quad \sqrt{81} = 9 \quad \text{Identify closest perfect square numbers and their roots.}$$

69 is close to 64 State which one it is closer to.

$$\sqrt{69} \approx 8.3 \quad \text{Approximate the value of the square root.}$$

Accept answers in the range 8.2 to 8.5.

(Module 2, Lesson 6)

Part C: Problem Solving (58 Marks)

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

1. Divide these fractions (show your work). (5 marks)

$$\frac{3}{5} \div 1\frac{5}{6}$$

Answer:

$$\frac{3}{5} \div \frac{11}{6}$$

$$= \frac{3}{5} \times \frac{6}{11}$$

$$= \frac{18}{55}$$

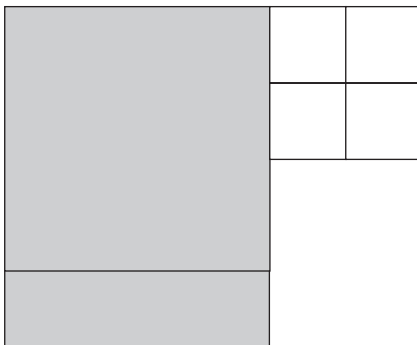
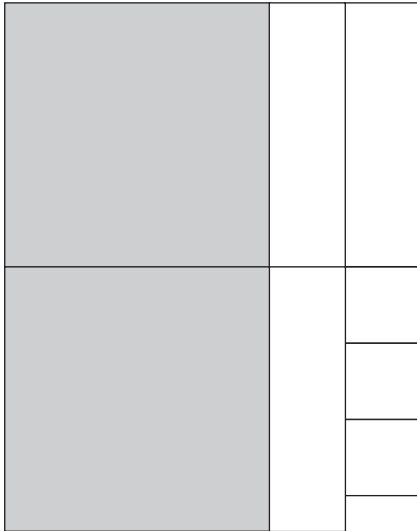
(Module 2, Lesson 3)

2. Use algebra tiles to illustrate the following expressions, then combine the like terms. State the answer. (5 marks)

$$2x^2 - 3x - 3$$

$$-x^2 + 4x - 1$$

Answer:



$$x^2 + x - 4$$

(Module 4, Lesson 3)

3. Your friend handed in the following work, and it was marked wrong. What mistakes did she make? Find the correct answer for the question. (5 marks)

$$6 \div \frac{1}{2}$$

$$6 \div 2 = 3$$

Answer:

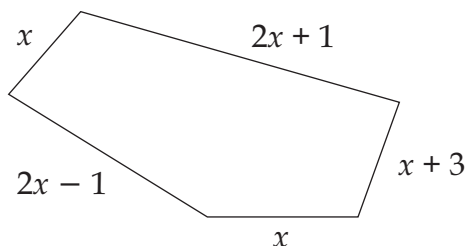
She changed the fraction, but she still divided (instead of multiplying).

$$\frac{6}{1} \times \frac{2}{1}$$

$$= 12$$

(Module 2, Lesson 3)

4. Find the perimeter of the figure below. (6 marks)



Answer:

$$x + (2x + 1) + (x + 3) + (2x - 1) + x$$

$$= x + 2x + x + 2x + x + 1 + 3 - 1$$

$$= 7x + 3$$

(Module 4, Lesson 7)

5. Identify the error(s) made, and do the question correctly. (6 marks)

$$\begin{aligned} &(-2 \cdot 5^3)^4 \\ &= 8 \cdot 5^7 \end{aligned}$$

Answer:

Two mistakes:

$(-2)^4$ is not 8, but 16

The exponents should be multiplied, not added: $3 * 4 = 12$.

$$= 16 \cdot 5^{12}$$

(Module 3, Lesson 3)

6. A family budget shows a monthly income of \$3200. Find the amount of money available for each category listed below. (8 marks)

Rent:	25%
Clothes:	20%
Utilities:	15.5%
Food:	30%

Answer:

Rent:	$3200 * 0.25 = 800$
Clothes:	$3200 * 0.2 = 640$
Utilities:	$3200 * 0.155 = 496$
Food:	$3200 * 0.3 = 960$

(Module 2, Lesson 2)

7. The number of millionaires in Canada increased by $4\frac{1}{2}\%$ last year. If there were 120 000 millionaires last year, then how many live in Canada now? (6 marks)

Answer:

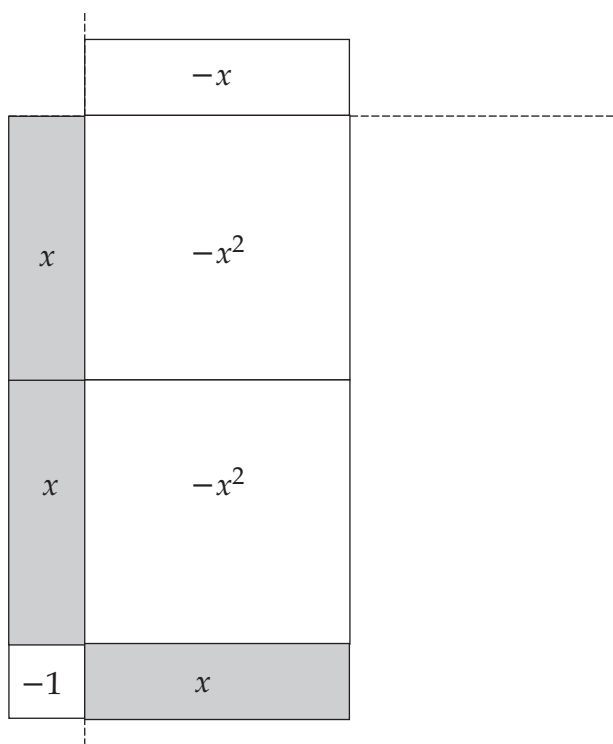
$$120\,000 \times 0.045 = 5400$$

$$120\,000 + 5400 = 125\,400$$

(Module 2, Lesson 2)

8. Label the algebra tiles, and state the answer to this multiplication. (6 marks)

Answer:



$$-2x^2 + x$$

(Module 4, Lesson 5)

9. Use arrows to show each step to find the quotient. (6 marks)

$$\frac{-20d^2 - 10d + 15}{-5}$$

Answer:

$$\frac{-20d^2 - 10d + 15}{-5}$$

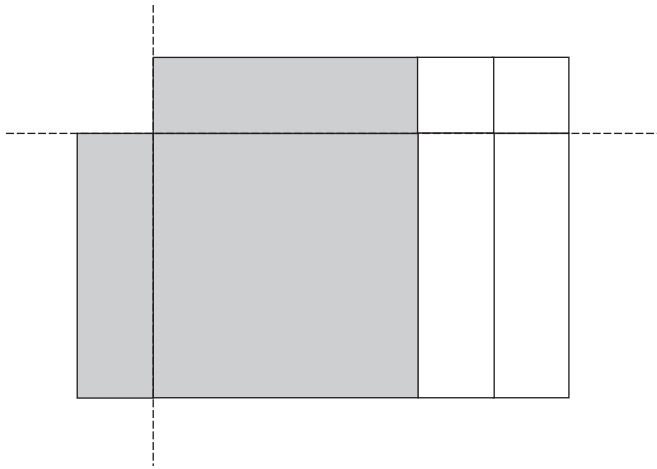
$$4d^2 + 2d - 3$$

(Module 4, Lesson 6)

10. Draw a tile diagram to illustrate how you would divide $x^2 - 2x$ by x . (6 marks)

Answer:

$$x - 2$$



(Module 4, Lesson 6)

NOTES