

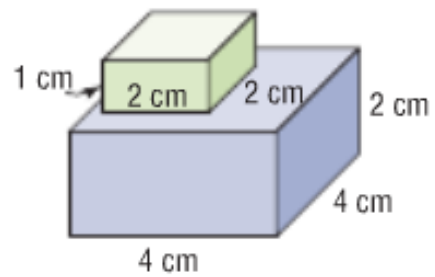
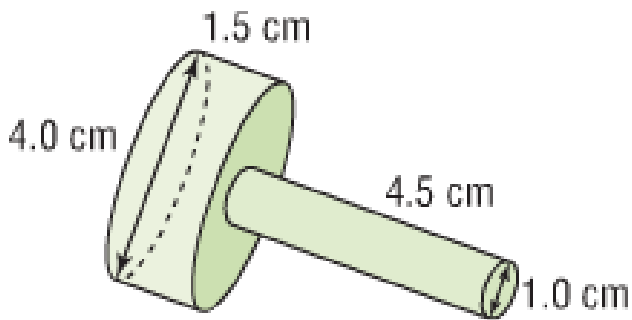
Grade Nine Mathematics 2016 Midterm Exam Review

Name: _____

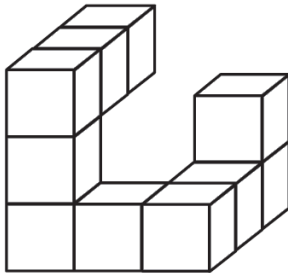
UNIT 1: SQUARE ROOTS AND SURFACE AREA

1. Solve $\sqrt{\frac{16}{25}}$ and $\sqrt{\frac{81}{49}}$
2. What is the square root of 9?
3. What is the square of 16?
4. Find the number that has a square root of $\frac{6}{13}$.
5. Find the square root of $\frac{25}{36}$.
6. Show, and explain, how to determine a reasonable estimate for $\sqrt{\frac{105}{63}}$.
7. Show how to find a number that has a square root between 2.2 and 2.3.
8. Determine a reasonable estimate for $\sqrt{0.05}$
9. A student said that $\sqrt{28}$ was between 25 and 36. Is this student correct?
10. You are covering the top of a square stool with felt. The area of the top is 270 cm^2 . Estimate the length of one side of the top of the stool. Based on your estimate, would 60 cm of trim be enough to completely go around the top of the stool? Explain.
11. Jordan wants to make a square flower bed that is 121 m^2 . What is the perimeter of the flower bed?

12. Determine the total surface area of each composite object.

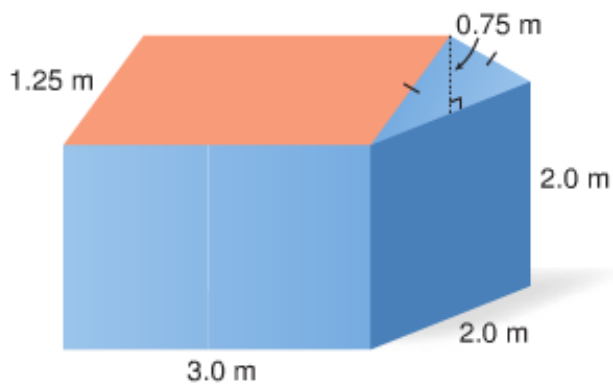


13. If one face is 2 cm^2 , then find the total surface area of the shape below and on the left.



b. How does the total surface area change if you remove the top block on the right?

14. Find the total exterior surface area of the house shown below and on the right.



CHAPTER TWO: POWERS AND EXPONENT LAWS

1. Does 5^2 and 2^5 mean the same thing?

2. Complete this table.

Power	Base	Exponent	Repeated Multiplication	Standard Form
4^2				
$-(-10)^5$				
	-6	2		
			$1 \times 1 \times 1 \times 1 \times 1$	
			$(-2)(-2)(-2)$	
			$3 \times 3 \times 3 \times 3 \times 3 \times 3$	
			$-(8 \times 8 \times 8)$	
	5	3		
-3^4				
$(-1)^{11}$				

3. Evaluate each power. **a)** 4^0 **b)** -23^0 **c)** $(-6)^0$

4. Evaluate.

a) $5 - 3^2$ **b)** $(5 + 3)^2$ **c)** $5^2 + 3^2$ **d)** $4^3 \times 2^3$ **e)** $-8^2 \div (-2)^3$

5. Evaluate.

a) $(18 \div 3^2 + 1)^4 - 4$ **b)** $3^3 \div 9(3^0 - 2^2)$ **c)** $(12^2 + 5^3)^0 - 2[(-3)^3]$

6. Find the mistake, circle it, and write the correct solution.

$$(7 - 5)^3 \times (8 + 2)^4 = (2)^3 \times (10)^4 = 6 \times 10000 = 60000$$

7. Write each product as a single power.

a) $4^3 \times 4^2$ **b)** $(-2)^2 \times (-2)^4$ **c)** $(-7) \times (-7)^2$

8. Write each quotient as a single power.

a) $8^7 \div 8^5$ b) $10^4 \div 10^0$ c) $\frac{(-9)^{10}}{(-9)^4}$

9. Express as a single power.

a) $2^3 \times 2^6 \div 2^9$ b) $\left[\frac{(-5)^4}{(-5)}\right]^4$ c) $\frac{6^3 \times 6^5}{6^2 \times 6^4}$

10. Evaluate.

a) $4^3 \div 4^2 + 2^4 \times 3^2$ b) $(-2)^6 \div (-2)^5 - (-2)^5 \div (-2)^3$ c) $\frac{3^4}{3^3} + \frac{4^2 \times 4^0}{2^4}$

11. Write each expression as a product of powers or a quotient of powers.

a) $[(-4) \times 3]^2$ b) $(10 \div 5)^3$ c) $(3^4 \times 2)^2$ d) $\left(\frac{2^6}{4^3}\right)^2$

12. Write as a single power.

a) $(3^4)^2$ b) $-(7^2)^2$ c) $[(-3)^3]^2$

13. Simplify, then evaluate

a) $4^0 + 4$ b) $(5^4 \div 5^2)^2$ c) $[(-3)^0 \times (-3)^3]^2$ d) $(10^2)^4 \div (10^3)^2$

14. Simplify, then evaluate each expression

a) $(3^2 \times 4^3)^2 - (4^4 \div 4^2)^2$ b) $(2^3 \div 2^2)^3 + (7^4 \times 7^3)^0$

c) $[(-1)^3]^4 - [(-1)^4 \div (-1)^3]^2$ d) $[(-5)^2 \times (-5)]^3 + (2^5 \div 2^3)^3$

CHAPTER THREE: RATIONAL NUMBERS

1. Evaluate. For questions with fractions, use common denominators.

a) $3\frac{1}{6} + (-5\frac{1}{2})$

b) $-2\frac{1}{3} + -5\frac{2}{5}$

c) $3\frac{4}{7} \div -8\frac{1}{6}$

d) $-7\frac{1}{4} - (-2\frac{1}{5})$

e) $3\frac{1}{4} - \left(-2\frac{2}{3}\right)$

f) $-\frac{3}{4} + 0.7$

g) $\left(\frac{10}{7}\right)\left(-\frac{13}{8}\right)$

h) $\left(-4\frac{3}{5}\right)\left(-2\frac{5}{12}\right)$

i) $\frac{-11}{15} \div \frac{-7}{5}$

2. Evaluate

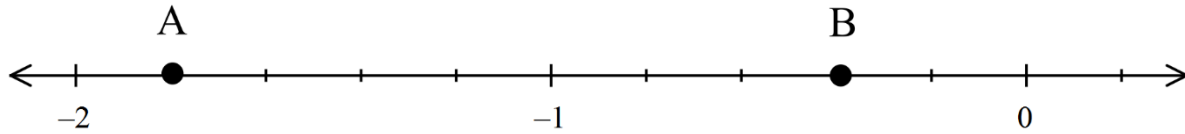
a) $-5.8 - 3.1 \times 0.5$

b) $\frac{3}{8} - \frac{9}{4} \div \left[\left(-\frac{5}{4}\right) + \left(-\frac{1}{10}\right)\right]$

e) $\frac{1}{2} \div \left[\frac{11}{3} + \frac{-1}{4}\right] \times \frac{3}{2}$

3. The product of 2 fractions is $-\frac{7}{8}$. If one fraction is $\frac{5}{6}$, what is the other fraction?

4. Label each dot as a fraction.



5. Identify a rational number between the following two numbers.

a) -3.6 and -3.7

b) $\frac{-5}{6}$ and $\frac{-6}{7}$

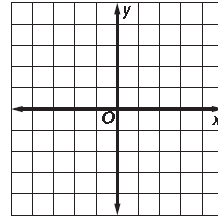
6. The temperature of the freezer changed from -16.1 degrees to -13.4. Did the temperature increase or decrease. By how much did the temperature of the freezer change. Use an equation to show. How much does the temperature of the freezer have to change before it reaches -2.9 degrees.

7. The lowest point on land in North America is Death Valley at 86 m below sea level. The highest point is the peak of Mt. McKinley at 6279.7 m above sea level. Calculate the distance between them.

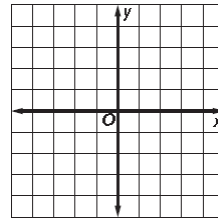
8. A weird restaurant puts the prices of its items on the menu in fraction form. A veggie burger cost $11\frac{3}{4}$. On Saturday's the price was $\frac{1}{2}$ off. What was the price of the veggie burger on that day. Solve the problem first using fractions

CHAPTER 4: LINEAR RELATIONS

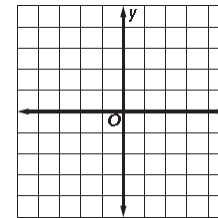
1. Graph $x = 5$. Describe the graph.



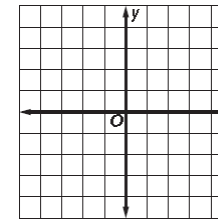
2. Graph $4x = -12$. Describe the graph.



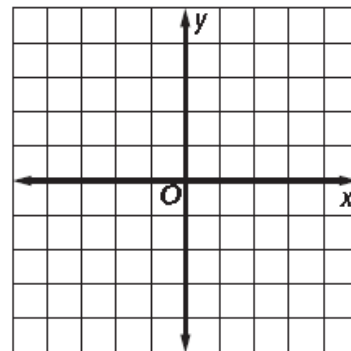
3. Graph $y = 7$. Describe the graph.



4. Graph $2y + 6 = 0$ Describe the graph.



5. Graph $4x + y = 5$ for values $x = -2, 0,$ and 2



6. Explain if each table represents a linear relation.

X	Y
9	6
8	13
7	20
6	27
5	34

X	Y
1	6
5	11
9	16
13	23
17	31

7. Rachel has a blockbuster rewards membership. It costs \$20 a year for the membership and each movie she rents costs her \$4.80.

a) Create a table that shows the cost for Rachel when she rents up to 5 movies.

b) Identify the independent and dependent variables.

c) Write an equation that relates the cost, C , to the # of movies, n , that Rachel rents.

d) What will the charge be when if she rents 14 movies?

e) How many movies did she rent if she spent \$130.40 ?

8 Make an equation for the linear relation shown in the table. Using the equation, what is the value of y when $x = 8$?

x	0	1	2	3
y	8	11	14	17

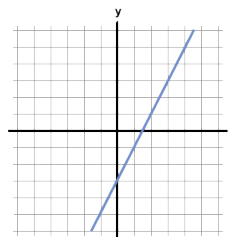
A blank 10x10 grid of squares, intended for drawing a picture.

10. Which equation would create the following table of values?

- a) $y = 4.50x + 100$
- b) $y = 4.50x - 100$
- c) $y = 100 - 4.50x$
- d) $y = 100 + 4.50x$

x	y
0	100
1	95.5
2	91
3	86.5
4	82

11. For the graph below, what is y when $x = 3$? Is this interpolation or extrapolation?



Which equation matches the graph?

- $y = 2x + 1$
- $y = 2x - 3$
- $y = -4 + 2x$
- $y = 9 - 3x$

12. Match each equation with a graph on this grid. Show all workings.

Equation #1: $y = 2x - 1$

Equation #2: $y = -x + 4$

Equation #3: $y = 3x - 3$

