

Name: _____

Period: _____

Algebra 1
Midterm
Review
January 2018

Formulas to know:

Name of Formula	Formula	Helpful Hints
Percent of Change (POC)	$\frac{\text{new} - \text{old}}{\text{old}} \cdot 100$	Remember noo!
Slope	$m = \frac{y_2 - y_1}{x_2 - x_1}$	$\frac{\text{rise (y)}}{\text{run (x)}}$ <p>I get up (y) from a chair, then run (x) across the room</p>
Rate of Change (ROC)	$\text{ROC} = \frac{y_2 - y_1}{x_2 - x_1}$	Same as slope!
Standard Form	$Ax + By = C$	<p>A is integer ≥ 0 Both A and B cannot equal 0 GCF of A, B and C is 1</p>
Slope-Intercept Form	$y = mx + b$	<p>m = slope b = y-intercept (beginning)</p>
Arithmetic Formula	$a_n = a_1 + (n - 1)d$	<p>$a_1 = \text{First term}$ $d = \text{common difference}$ $n = \text{the term position}$</p>

Chapter 1:

1.1-Variables and Expressions:

Translate each expression and solve:

1. 6 less than 3 times a number is 42. What is the number?
2. The product of 15 and a number has a result of 90. What is the number?
3. 25 less than the sum of a number and 5 results in 15. What is the number?
4. The quotient of 18 and a number is three. What is the number?

1.2-Order of Operations

Evaluate each expression if $x = 2$, $y = 3$ and $z = 4$

1. $2x^2 + (3y^3 - 4z)$
2. $4xy - yz$
3. $\frac{z}{x} + 4y$

1.6-Relations

Express each relation as a mapping. Determine the Inverse Relation.

1. $\{(-5,-1), (4,3), (2,3)\}$
2. $\{(-1,0), (3,3), (1,4), (4,2)\}$
3. $\{(0,4), (3,-4), (2,-3), (1,0)\}$

1.7-Functions

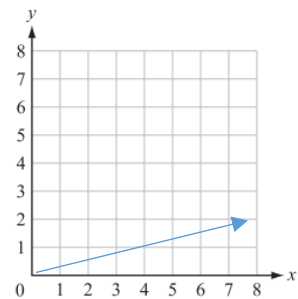
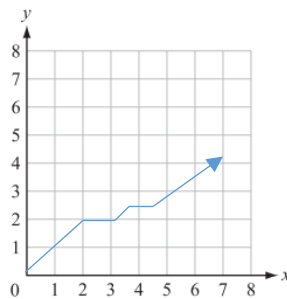
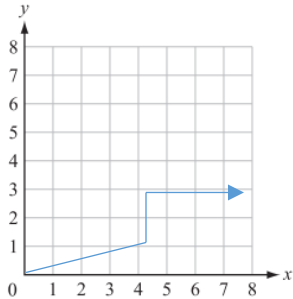
Solve:

1. If $f(x) = 2x^2 - x + 4$, find $f(-3)$.
2. If $g(x) = -5x - 12$, find $g(-8)$.
3. If $h(x) = 3x^3 + 2x^2 + x$, find $h(2)$.

1.8-Interpreting Graphs of Functions

Pick the graph that best represents each situation:

1. A family is taking a car trip. The family travels at a constant rate of speed for 2 hours. The family stops for lunch and 1 hour later, continues the trip. They drive for half an hour before being pulled over by a cop. They talk to the cop for 1 hour before continuing their trip.



Chapter 2:

2.3 Solving Multi – Step Equations:

Solve:

1. $3x - 5 = 7$

2. $-3 + \frac{x}{5} = 22$

3. $4(x + 2) = 3(x - 6)$
4. The sum of three consecutive integers is -48. What are the integers?
5. The sum of two consecutive odd integers is 36. What are the integers?
6. The entrance fee for the carnival is \$7 and the cost for a ticket for a ride is \$.25.
 - a. Write an equation for the total cost (C) if you go to the carnival and ride r number of rides.
 - b. What is the total cost if you ride 15 rides?

2.5 Absolute Values:

Solve each equation:

1. $|y - 5| = 11$
2. $|x| + 7 = 35$
3. $\frac{|x|-2}{5} = 12$
4. $|y - 6| = -17$

2.6 – Ratios and Proportions

1. Which does not represent a ratio:

- a. 2:7 b. $\frac{2}{7}$ c. 2 to 7 d. 2 + 7

2. Remember word fractions to solve Proportions. Use Cross Multiplication to solve!

- If 5 apples cost \$3.00, how much would I pay for 2 apples?
- If a car travels 75 miles in half an hour, how long will the car travel in five and a half hours?
- If a restaurant sells 35 hamburgers for \$120 on one night, how much will the restaurant make for selling 40 hamburgers?

2.7 Percent of Change and Tax:

- Find the percent of change of a car that costs \$45,675 in 2017, but cost \$38,150 in 2010.
- The price of a sweat shirt is \$28. Last week, the price of that sweat shirt was \$20. What is the percent of change of the price of the sweat shirt?
- In 2014, 455 students were enrolled in Algebra class. Today there are 715 students enrolled in Algebra. What is the percent of change of students enrolling in Algebra class?

4. A new Iphone costs \$375. There is a 6.5% sales tax. What is the final cost of the Iphone?
5. A video game costs \$35. Sales tax is 5%. Which equations can be used to determine the cost of the video game. Check all that apply.
 - a. $\text{Cost} = 35 + 35(.05)$
 - b. $\text{Cost} = 35(1+.05)$
 - c. $\text{Cost} = 35 (1+.5)$
 - d. $\text{Cost} = 1.05(35)$
 - e. $\text{Cost} = 35 + 35(.5)$

2.8-Literal Equations

Solve each for the specified variable:

1. $6x + 2y = 17$ for y
2. $\frac{2a+3c}{d} = 5 + f$ for a
3. $m = 4n + 5p$ for n

Chapter 5:

5.3 Solving Multi-Step Inequalities

Solve and graph:

1. $7x - 15 \leq 2x + 5$

2. $4y - 19 > 1$

3. $16x \geq 8x + 72$

4. $6x + 12 < 18x - 12$

5.5 Compound Inequalities

Draw the graph for the following compound inequalities:

1. $m \leq 2$ or $m > 7$

2. $m \geq 2$ and $m < 7$

3. $y < 6$ or $y \geq 8$

4. $y < 6$ or $y > 6$

5. $2 \leq x < 10$

Chapter 3:**3.1 Linear Equations**

Determine which of the following are linear equations. Pick all that apply:

$2x + 4y = 8$

$y = \frac{1}{3}x$

$5x + xy = 12$

$x^2 + 2y = 7$

$x + y^2 = 9$

$\frac{1}{3}x + 2 = -5$

$\frac{3}{x} + 4y = 5$

$y = 16 - 2x$

$3x - 5y + 3 = x - 7$

Write in Standard Form:

1. $y = -3x + 8$
2. $2(x + 3) - 5y = x - 12$
3. $4x + 12 - 2y = x + y - 3$

Find the intercepts for:

1. $6x + 3y = 36$
2. $y = \frac{2}{3}x + \frac{1}{3}$
3. $y - 2 = 3(x - 2)$

3.3 – Rate of Change and Slope

1. Find the slope of the line that passes through (0, 5) and (6, 2).
2. Find the slope of the line that passes through (-6, 4) and (-6, -2).
3. Find the missing coordinate of a line that passes through (2, r) and (5, 10) that has a slope of $\frac{1}{2}$.
4. The average cost of online photos decreased from \$0.50 per print to \$0.15 per print between 2002 and 2009. Find the average rate of change in the cost. Explain what it means.

3.4 – Direct Variation

1. Write a direct variation equation to relate x and y if $y = 15$ when $x = 2$. Then find y when $x = 6$.
2. Write a direct variation equation to relate x and y if $y = 22$ when $x = 11$. Then find x when $y = 77$.

3.5– Arithmetic Sequence

1. Find the next four terms of the sequence:
29, 26, 23, 20, ...
2. Find the next three terms of the sequence:
12, 16, 19, 23, 26, ...
3. Find the 15th term of the following sequence
16, 19, 22, 25, ...

Chapter 4:

4.1 – Graphing Equations in Slope-Intercept Form

Graph each equation

1. $y = 2x - 4$

2. $y = -\frac{1}{2}x + 3$

3. $2x + 3y = 6$

Convert to slope intercept form:

1. $3x + 3y = 6$

2. $4(x + 2) = 3(y - 8)$

4.2 – Writing Equations in Slope-Intercept Form

Write the equation of a line in slope-intercept form that passes through the points:

1. (2, 2) and (4, 1)

2. (5, -8) and (4, -8)

3. (6, 4) and (2, -3)

4.4-Parallel and Perpendicular Lines

Parallel Lines:

Write the equation of a line that is parallel to:

1. $y = 2x - 4$ and passes through the point (2, 5)

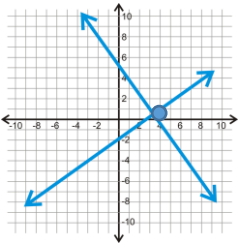
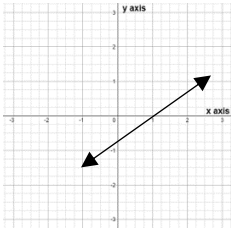
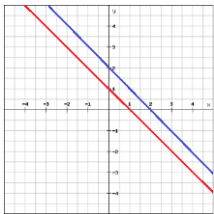
2. $y = \frac{1}{3}x + 5$ and passes through the point (0, 3)

Write the equation of a line that is perpendicular to:

- $y = -2x - 4$ and passes through $(1, 3)$
- $y = \frac{1}{3}x + 4$ and passes through $(-5, 2)$

Chapter 6:

Know how to read graphs of a system of equations:

Intersecting Lines	Same Line	Parallel Lines
		
<p>One solution (at intersection)</p>	<p>Infinitely Many solutions</p>	<p>NO Solutions!</p>

- The sum of two numbers is ten. The difference of the same two numbers is 18. Write a system of equations and find the two numbers by graphing.

2. John has saved dimes and quarters in her piggy bank. John has 25 coins which total \$4.00. Write a system of equations to determine the number of dimes and quarters he has. Then solve the system using the best method for the situation.

5.6 Graphing Inequalities in Two Variables

Graph the inequality:

1. $y \leq \frac{1}{2}x - 2$

2. $y > 3x + 4$

What is the inequality of the following graph:

