Accelerated Coordinate Algebra Name_____

Benchmark 2--Study Guide

Date_____ Period____

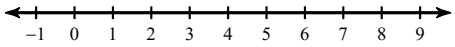
Solve each equation.

1) $-3k - 4 = -8 - 5k$

2) $6 - 7x = -1 - 7x$

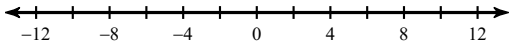
Solve each inequality and graph its solution.

3) $-106 \le -3(5x + 5) + 2x$

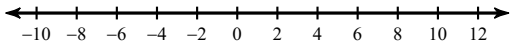


Solve each compound inequality and graph its solution.

4) $-6 + 3b \ge 21$ or $9 + 7b \le -47$



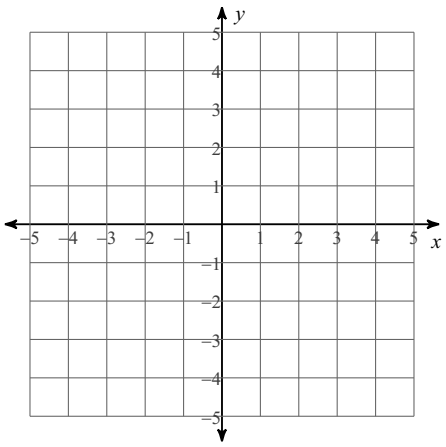
5) $6m + 5 > -49$ and $-7m - 3 > -73$



Solve each system by graphing.

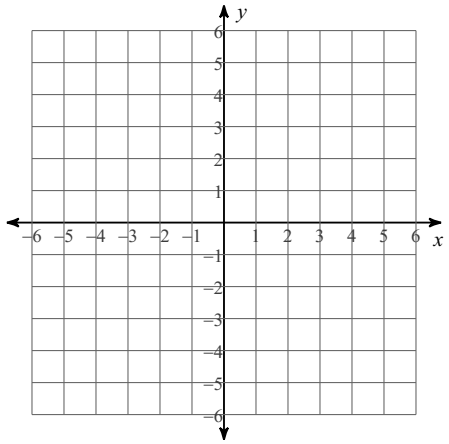
6) $2y = -5x + 6$

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



Sketch the graph of each linear inequality.

7) $2x + 3y \leq -3$



Solve each system by substitution.

8) $-8x + y = -6$
$-16x + 2y = -4$

Solve each system by elimination.

9) $2x + 4y = 14$
$9x + 8y = -7$

10) Jaidee and Amanda each improved their yards by planting hostas and geraniums. They bought their supplies from the same store. Jaidee spent $63 on 7 hostas and 7 geraniums. Amanda spent $102 on 14 hostas and 10 geraniums. What is the cost of one hosta and the cost of one geranium?

11) A rectangle has a length of $x - 3$ inches and a width of 6 inches. For what values of x is the area of the rectangle greater than the perimeter of the rectangle? Draw a diagram to help.

12) A cyclist 45 miles in 4 hours. What is her speed in feet per second?

13) Solve $\frac{m}{x} = k - 6$ for m.

14) A rectangle has side lengths of 12 inches and 9 inches. Every dimension is multiplied by $\frac{1}{3}$ to form a new rectangle.
What is the scale factor? _____

What is the ratio of the corresponding sides of the first figure to the second figure? _____

What is the ratio of the perimeters? _____

What is the ratio of the areas? _____

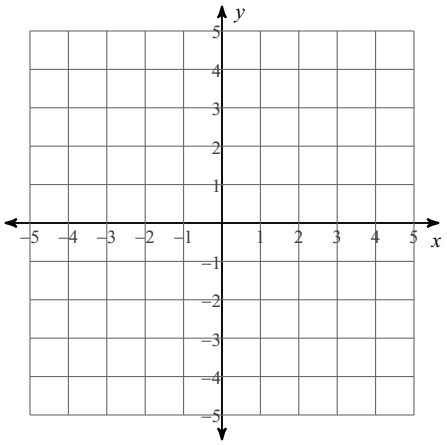
15) An architect built a scale model of a shopping mall. On the model, a circular fountain is 20 inches tall and 22.5 inches in diameter. The actual fountain is to be 8 feet tall. What will be the diameter of the fountain?

Solve each proportion.

16) $\frac{9}{7} = \frac{r + 6}{10}$

Sketch the solution to each system of inequalities.

17) $y \geq 2x - 3$
$y > -3x + 2$



Write the slope-intercept form of the equation of each line given the slope and y-intercept.

18) Slope = -1, y-intercept = 3

Write the slope-intercept form of the equation of the line through the given point with the given slope.

19) through: $(3, -4)$, slope = $-\frac{7}{3}$

Write the slope-intercept form of the equation of the line through the given points.

20) through: $(0, 3)$ and $(4, -2)$

Write the slope-intercept form of the equation of the line described.

21) through: $(-4, -1)$, parallel to $y = \frac{3}{2}x + 1$

22) through: $(1, -2)$, perp. to $y = 3$

Find the slope of the line through each pair of points.

23) $(8, -11), (-2, 11)$

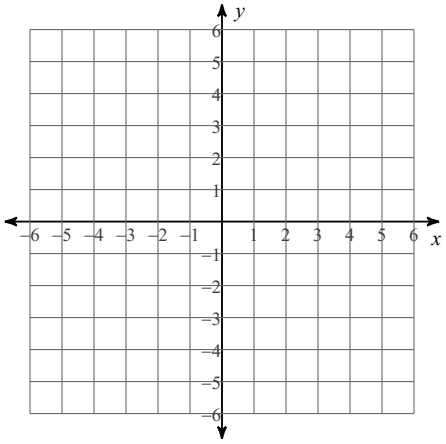
24) $(2, -12), (2, 18)$

Find the x-intercept and the y-intercept.

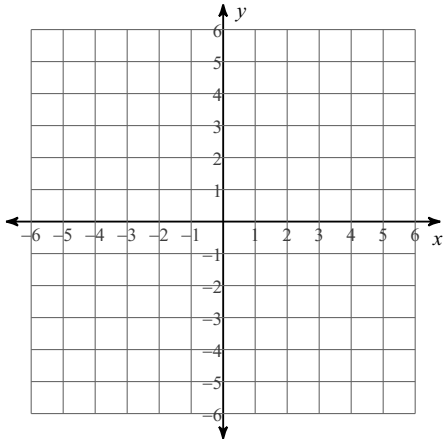
25) $x + 3y = -9$

Sketch the graph of each line. Then describe the transformations from the parent function $y = x$.

26) $x - 5y = 10$



27) $2x + y = 1$



Determine if the sequence is arithmetic. If it is, find the common difference, the 52nd term, and the explicit formula.

28) $-6,\ -10,\ -14,\ -18,\ ...$

29) $28,\ 58,\ 88,\ 118,\ ...$

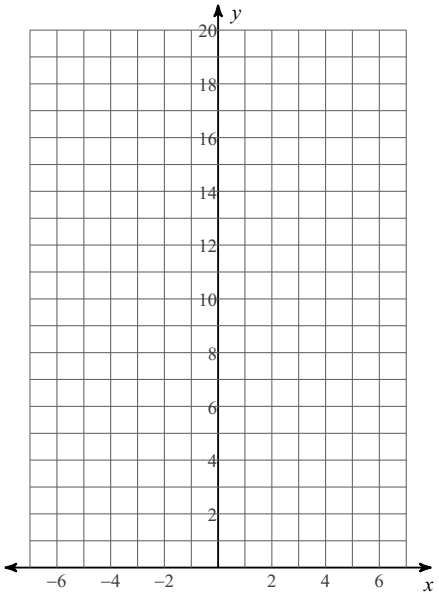
Determine if the sequence is geometric. If it is, find the common ratio, the 8th term, and the explicit formula.

30) $4,\ -8,\ 16,\ -32,\ ...$

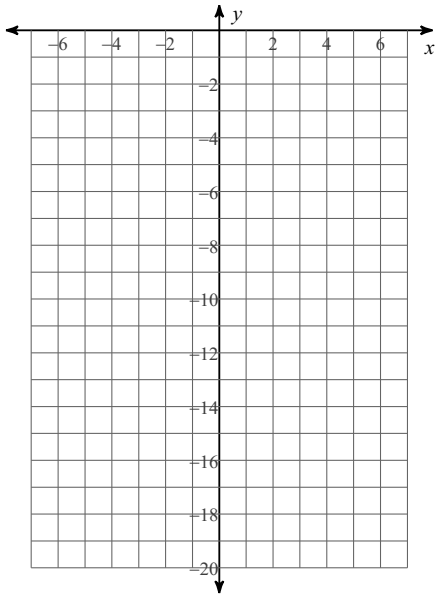
31) $4,\ 16,\ 64,\ 256,\ ...$

Sketch the graph of each function.

32) $y = 3 \cdot 2^x$



33) $y = -2 \cdot \left(\frac{1}{2}\right)^x$



Write an exponential model and the find the total value of the investment after the time given.

34) $57,000 at 3% compounded annually for 4 years

35) $37,000 at 12.6% compounded quarterly for 2 years

36) Flourine-20 has a half-life of 11 seconds. Find the amount of Flourine-20 left from a 40 gram sample after 2.2 minutes.

37) The value of a gold coin is $150 and is increasing at a rate of 15% each year. Find the value of the coin in 11 years.

Look for a pattern in each data set to determine which kind of model best describes the data.

38) {(0,6), (1, 12), (2, 24), (3, 48)}

39) {(3, 4), (6, -2), (9, -8), (12, -14)}

Compare the average rates of change over the interval given.

40) Michael is studying population changes in two types of birds living on an island. Compare the population by finding and interpreting the average rate of change ove r the interval $(0, 18)$.

Bird A

Time(months)	0	6	12	18
Pop.(thousands)	8.3	8.6	8.8	9.1

Bird B

$y = 3.6 \cdot 1.06^x$

41) Mr. Krabbs has $2500 in his savings account. He wants to save more money. He is considering two plans. Under Plan, 1 he will increase his balance by $500 each year. Under Plan2, he will increase his balance by 25% each year. How much more will he save with Plan 2 after 10 years? Round to the nearest hundredth.

42) What is the domain of an exponential function?

A) $y \geq 0$ B) All real numbers

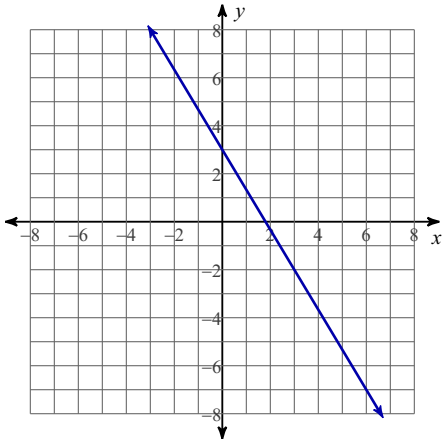
C) $x > 0$ D) $x \geq 0$

43) A weight loss company is offering a 6 week special. You can lose up to 25 pounds in 6 weeks for a one time fee of $50. What are the possible values for the range?

A) All integers between 0 and 6
B) All whole numbers greater than 0
C) None of the above
D) All real numbers between 0 and 25

Analyze the graph.

44)



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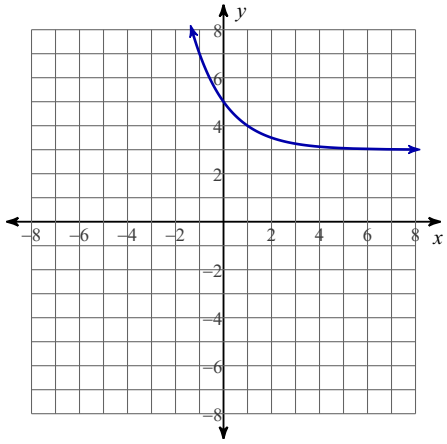


46) Which of the following exponential decay functions have a vertical shrink and vertical shfit down?

A) $y = -2 \cdot \left(\frac{1}{4}\right)^x - 1$
B) $y = -\frac{1}{2} \cdot 4^x - 1$
C) $y = -\frac{1}{2} \cdot \left(\frac{1}{4}\right)^x + 1$
D) $y = -\frac{1}{2} \cdot \left(\frac{1}{4}\right)^x - 1$

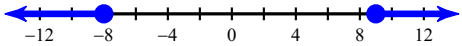
Answers to Benchmark 2--Study Guide

1) $\{-2\}$

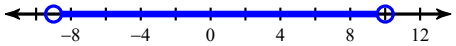
2) No solution.

3) $x \le 7$:

4) $b \ge 9$ or $b \le -8$:

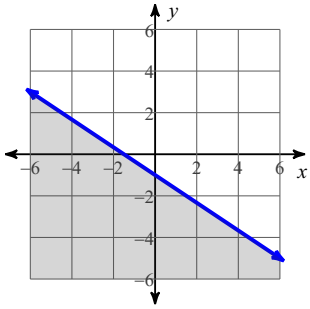


5) $-9 < m < 10$:



6) $(2, -2)$

7)



8) No solution

9) $(-7, 7)$

10) hosta: \$3, geranium: \$6

11) $x > 6$

12) 16.5 ft/s

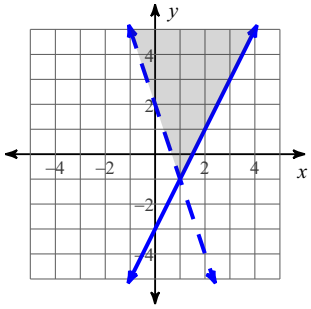
13) $m = x(k - 6)$

14) $\frac{1}{3}$, 3, 3, 9

15) 9 ft

16) $\{6.85\}$

17)



18) $y = -x + 3$

19) $y = -\frac{7}{3}x + 3$

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

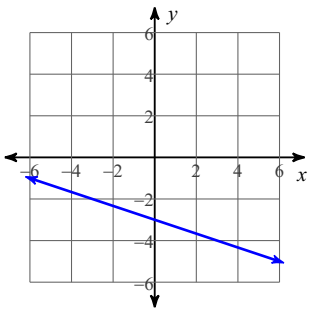
21) $y = \frac{3}{2}x + 5$

22) $x = 1$

23) $-\frac{11}{5}$

24) Undefined

25)



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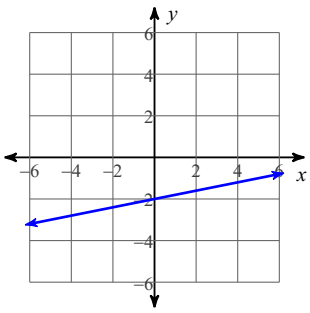

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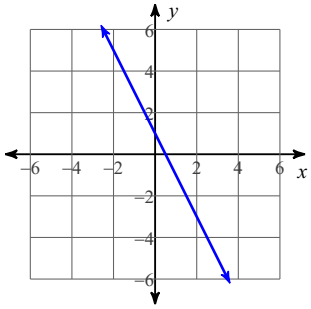
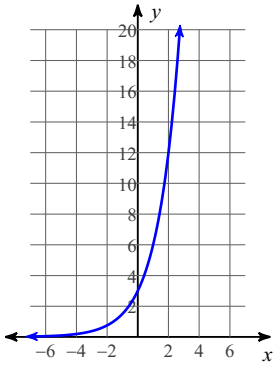


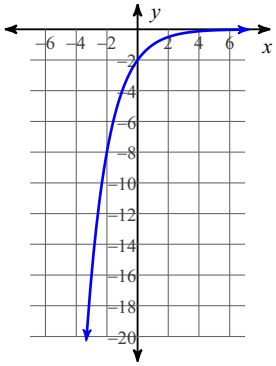
28) Common Difference: $d = -4$
$a_{52} = -210$
Explicit: $a_n = -2 - 4n$

29) Common Difference: $d = 30$
$a_{52} = 1558$
Explicit: $a_n = -2 + 30n$

30) Common Ratio: $r = -2$
$a_8 = -512$
Explicit: $a_n = 4 \cdot (-2)^{n-1}$

31) Common Ratio: $r = 4$
$a_8 = 65536$
Explicit: $a_n = 4 \cdot 4^{n-1}$

32) 

33) 

34) $64,154.00

35) $47,419.35

36) approximately 0.01 grams

37) $697.86

38) Exponential

39) Linear

40) The population of Bird B is increasing more rapidly but starts at a smaller population.Bird A starts at 8.3 thousand birds, but Bird B starts at 3.6 thousand birds. Bird A: increases 44 birds per month, Bird B: increases 372 birds per month.

41) After 10 years: Plan 1 earns $7500, Plan 2 earns $23,283.06; Plan 2 earns $15,783.06 more

42) B

43) D

44)

45)

46) D