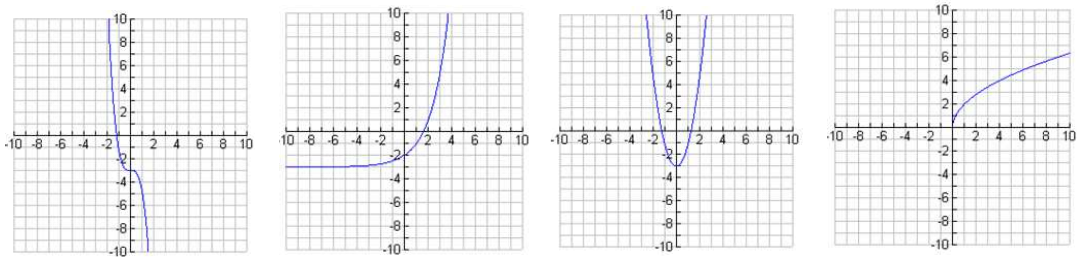
UCS JH Algebra I **REVIEW GD #1**

1 Which family of function is *not* shown below?



A Quadratic

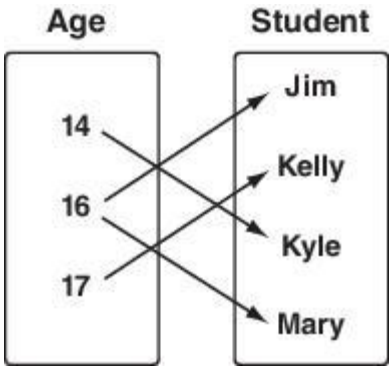
B Absolute Value

C Square Root

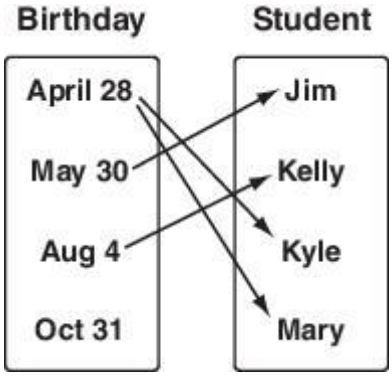
D Exponential

2 The following diagrams show relationships among a group of students. Which relationship is a function?

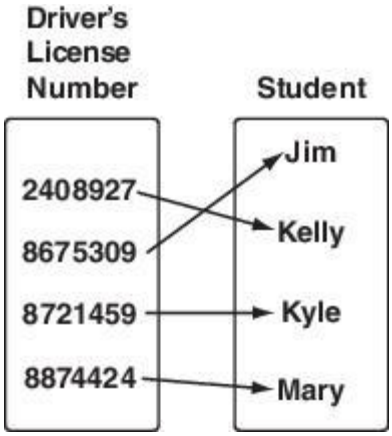
A



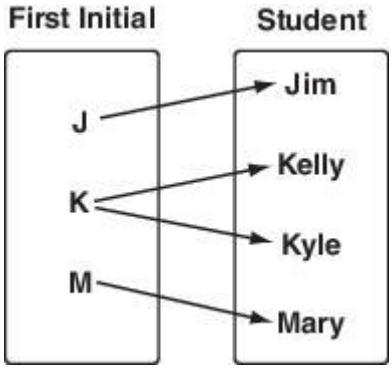
B



C



D



3 Carol is studying this chart of early U.S. presidents.

Early U.S. Presidents		
Name	Years in Office	Wife's First Name
George Washington	1789-1797	Martha
John Adams	1797-1801	Abigail
Thomas Jefferson	1801-1809	Martha
James Madison	1809-1817	Dolly
James Monroe	1817-1825	Elizabeth
John Quincy Adams	1825-1829	Louisa

Based on the chart, which of the following represents a function?

A Given a president's first name, you can determine the president's last name

B Given a year between 1789 and 1829, you can determine the name of the president.

C Given a president's full name, you can determine the first year he was in office

D Given a wife's first name, you can determine the name of the president

4 Function g is defined below.

$$g(x) = -\frac{1}{2}x + 7$$

If the range of function g is $\{4.325, 6.225\}$, what is the domain of function g ?

A $\{4.8375, 3.8875\}$

B $\{1.55, 5.35\}$

C $\{-1.55, .5.35\}$

D $\{-4.325, -6.225\}$

5 The percent of fat (p) in a food depends on how many grams of fat (g) the food contains. The percent of fat in 300-calorie foods is given by this equation.

$$p(g) = \frac{9}{300}g$$

Which table can be used to correctly graph this equation?

A

g	p
2	0.06
3	0.09
5	0.15
10	0.3

B

g	p
2	0.015
3	0.01
5	0.006
10	0.003

C

g	p
2	0.007
3	0.01
5	0.017
10	0.03

D

g	p
2	0.03
3	0.03
5	0.03
10	0.03

6 The number of boxes (b) that a machine in a manufacturing plant can pack in (t) minutes can be

$b(t) = t^2 + 6t$

What is the appropriate **range** for this function?

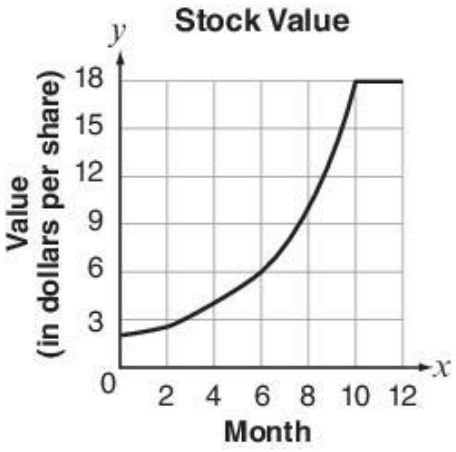
A All Real Numbers

B All Natural Numbers

C All Real Numbers Greater than 6

D All Natural Numbers Greater than 6

7 The value of a stock, in dollars per share, during a one-year period is shown on the graph below.



Which of these statements BEST describes the change in value of the stock?

A The lowest rate of change occurred during the first month.

B The highest rate of change occurred during the eleventh month.

C The rate of change was lower during the fourth month than during the eleventh month.

D The rate of change was higher during the fourth month than during the eleventh month.

8 The humidity in a greenhouse changed daily according to the function:

$$f(x) = 40(0.95)^x$$

Which sentence BEST describes the humidity?

A The humidity stays the same from one day to the next.

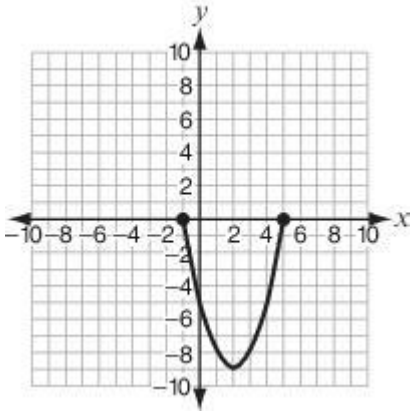
B Each day the humidity is 5% less than the previous day.

C Each day the humidity is 95% more than the previous day.

D The humidity increases at a constant rate of 95% each day.

UNIT 2

9 A section of a parabola is graphed below.



Which inequality describes the domain of this function?

A $x \geq -1$

B $x \geq -9$

C $-1 \leq x \leq 5$

D $-9 \leq x \leq 0$

10 Which situation can be represented by a linear equation?

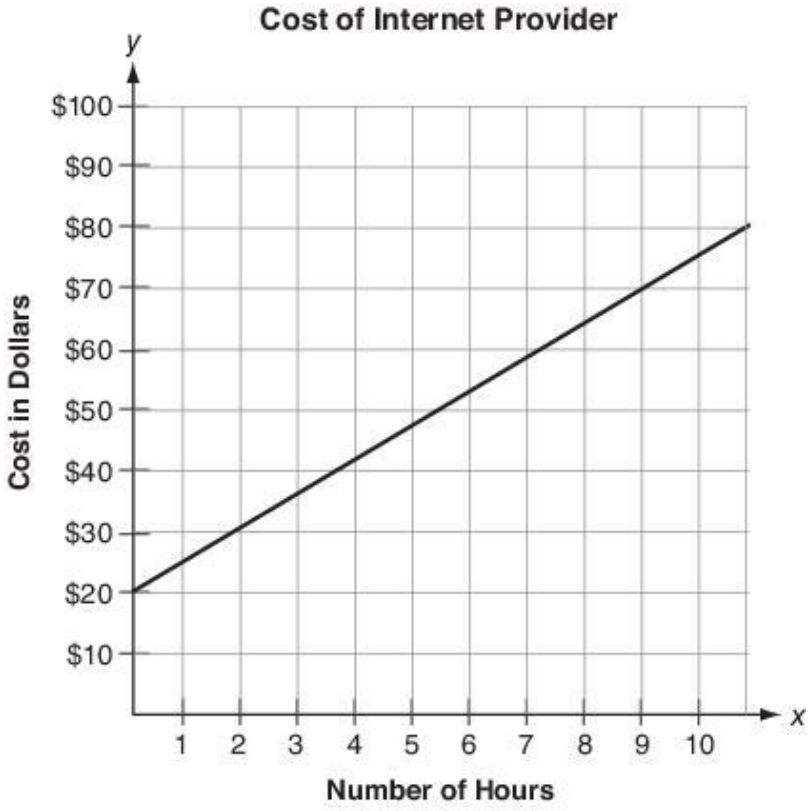
A The area of a square related to the measure of one of its sides

B The length of hair of a person who gets a haircut at random times throughout the year.

C The yearly balance of a person's savings account earning compound interest

D The number of minutes left in a class period as recorded every 10 minutes once class has begun.

11 In the graph below, x represents the number of hours Rick uses the Internet and y represents the total cost of his Internet provider. Which function best represents this situation?



A $y = 5x$

B $y = 20x$

C $y = 5x + 20$

D $y = 20x + 5$

UNIT 3

12 On an algebra test, the highest grade was 38 points higher than the lowest grade. The sum of the two grades was 142. Find the lowest grade.

A 90

B 71

C 38

D 52

13 The perimeter of a rectangle is 276 feet. The length of the rectangle is 3 more than twice its width. Find the length and width of the rectangle.

A Length = 185 ft; Width = 91 ft.

B Length = 99 ft; Width = 44 ft.

C Length = 93 ft; Width = 45 ft.

D Length = 45 ft; Width = 21 ft.

14 You just got a new puppy. Bones cost $2.00 each, and toys cost $6.00 each. Write an equation to relate the number of bones ***b*** and toys ***t*** you are able to buy your puppy with $30.00.

A $6b - 2t = 30$

B $2b + 6t = 30$

C $6b + 2t = 30$

D $30 + 2b = 6t$

15 There are at most 12 bicycles and tricycles in a school playground. There are at least 17 wheels altogether. Let b equal the number of bicycles and t equal the number of tricycles. Which system describes this situation?

A $b + t < 12$
$2b + 3t \geq 17$

B $b + t \leq 12$
$2b + 3t > 17$

C $b + t \leq 12$
$2b + 3t \geq 17$

D $b + t \leq 12$
$2b + 3t \leq 17$

16 The formula for the perimeter of a rectangle is shown below. Solve the formula for the variable *w*.

$$P = 2l + 2w$$

A $w = P - l$

B $w = \frac{P}{2} - l$

C $w = P - 2l - 2$

D $w = \frac{P - w}{2}$

17 State which inequalities have equivalent solution sets.

i. $\frac{1}{3}x \geq \frac{2}{3}$
ii. $-3x \geq -6$
iii. $x + 4 \geq 6$

A i. and ii.

B i. and iii.

C ii. and iii.

D i., ii., and iii.

18 Which graph shows the solution set of the inequality below?

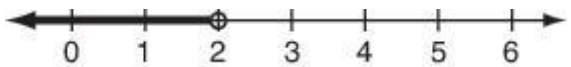
$$-3x + 3 > -9$$

A

B

C

D



19 Simplify the following compound inequality.

$$57 \leq 3x - 15 \leq 75$$

A $14 \leq x \leq 20$

B $14 \geq x \geq 20$

C $24 \leq x \leq 30$

D $24 \geq x \geq 30$

20 Determine if the following functions are perpendicular, parallel, or neither.

$$3x - 5y = 13$$

$$y - 3 = \frac{3}{5}(x - 7)$$

A Perpendicular

B parallel

C Neither

D Cannot be determined

21 What are the x- and y-intercepts of the following function?

$$4x = 6y + 12$$

A (3, 0) and (0, –2)

B (–3, 0) and (0, 2)

C (0, 3) and (–2, 0)

D (0, –3) and (2, 0)

22 Two systems of linear equations are shown below.

$$\begin{cases} 10x - 5y = 25 \\ x - y = 15 \end{cases}$$

$$\begin{cases} -10x + 5y = -25 \\ 2x - 2y = 30 \end{cases}$$

Which statement is a correct comparison of the solutions of these systems?

A The *x*-value is the same, but the *y*-values are different.

B The *x*- and *y*- values are the same.

C The *x*-values are different, but the *y*-value is the same.

D The *x*- and *y*- values are different.

23 *How many* solutions does the following system of linear equations have?

$$4x - 2y = 16$$
$$3y = 6x - 24$$

A Zero

B One

C Two

D Infinite

24 Solve the system of equations.

$$-3x - 9y = -3$$
$$2x + 9y = 11$$

A (1, 0)

B (1, 1)

C (-1, -2)

D (-8, 3)

25 Sophie graphed the line $y = -\frac{1}{4}x + 3$ on a coordinate plane. Which ordered pair could ***not*** be on the line?

A (12, 0)

B $(7, \frac{5}{4})$

C $(-\frac{1}{4}, 3)$

D (16, -1)

26 A company sells brass and steel machine parts. One shipment contains 3 brass and 10 steel parts and costs $48. A second shipment contains 7 brass and 4 steel parts and costs $54.

a) Find the cost of each type of machine part.
b) How much would a shipment containing 10 brass and 13 steel machine parts cost?

A a) Brass $3, Steel $6;
b) $108

B a) Brass $6, Steel $3;
b) $108

C a) Brass $6, Steel $3;
b) $99

D a) Brass $3, Steel $6;
b) $99

27 Your pool has 15,000 gallons of water. We are draining it for the winter season and want 4000 gallons to remain. If it drains at 1,500 gallons per hour, how long until you have finished draining?

A 7 hours 33 minutes

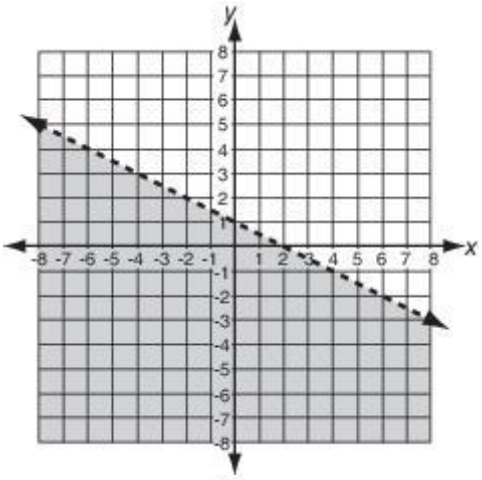
B 2 hours 40 minutes

C 10 hours

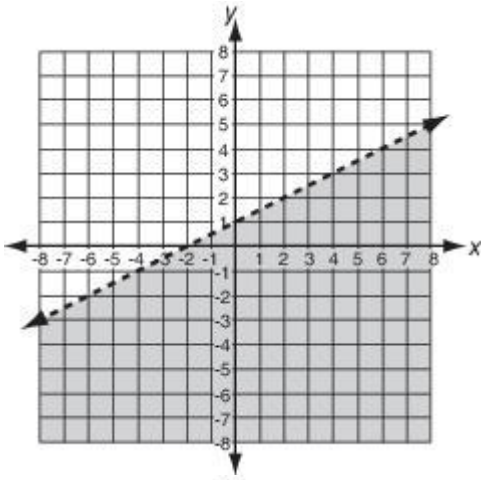
D 7 hour 20 minutes

28 Which of the following graphs could represent the solution set of the inequality $y < \frac{1}{2}x + 1$?

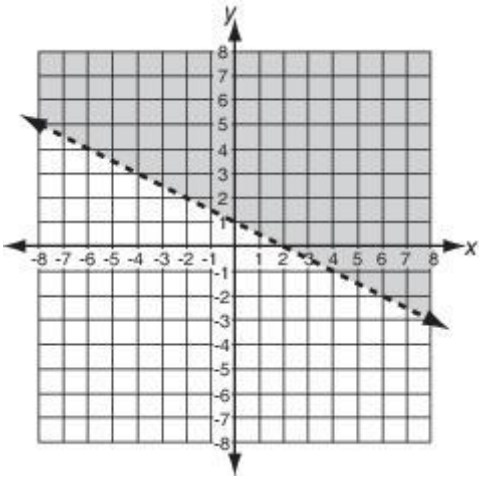
A



C



B



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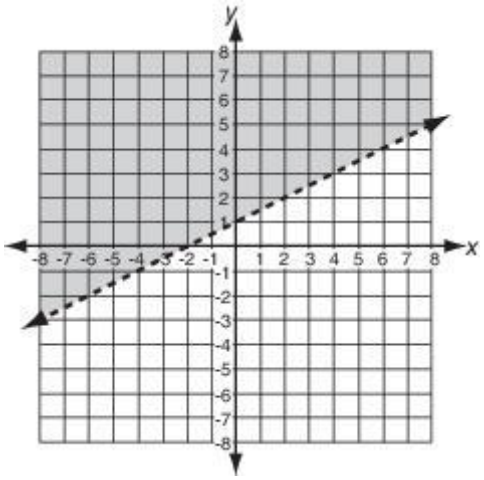
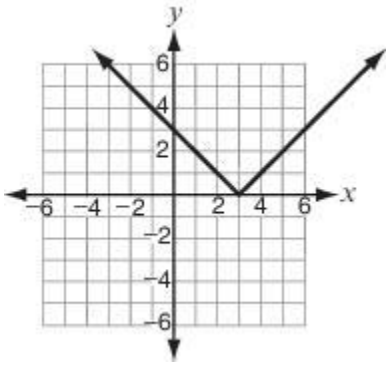
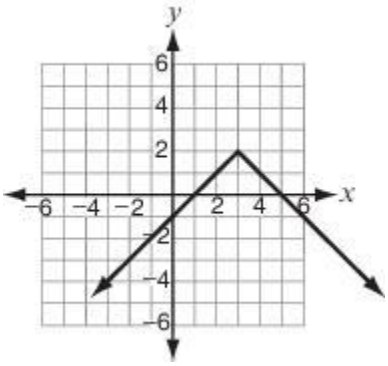


29 Sue translated the graph of $y = |x|$ 3 units to the right and 2 units down. Which of the following shows Sue's new graph and correct equation?

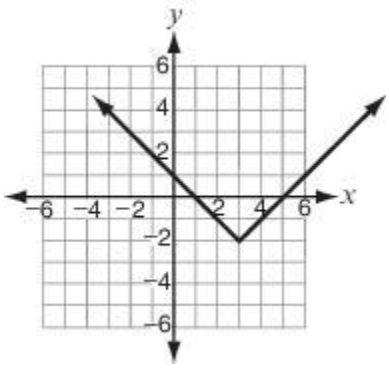
A $y = |x + 3| + 2$



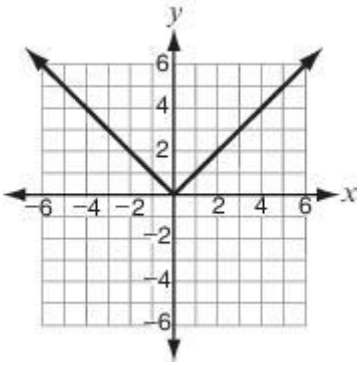
C $y = |x + 3| + 2$



B $y = |x - 3| - 2$



D $y = |x - 3| - 2$



30 Function $f(x)$ has the equation $f(x) = 5(2)^x$, and function $g(x)$ is described by the table below.

x	g(x)
1	40
2	20
3	10
4	5

How are these two functions alike?

A Both are linear functions.

B Both are exponential functions.

C Both have graphs with the same *y*-intercept.

D Both have graphs that approach $+\infty$ as x approaches $+\infty$.

31 Which statement is true about the graphs of $y = \frac{2}{5}x + 4$ and $2x - 5y = -15$?

A They represent the same graph.

B They have different slopes and *y*-intercepts.

C They have different slopes but the same *y*-intercept.

D They have the same slope but different *y*-intercepts.

32 Which situation BEST shows a constant rate of change?

A the number of even days ***d*** in the month of January

B the number of odd days ***d*** in the month of February

C The number of pieces of candy you receive during Halloween

D The amount of gas you put into your car each time you fill up

UNIT 4

33 What is the constant in the expression $12x^3 - 2x^2 + x$

A 3, 2, and 1

B 12, – 2, and 1

C 0

D There is no constant value

34 Is the following a growth or decay function? How can you tell? $f(x) = 0.5\left(\frac{3}{2}\right)^x$

A Growth. The growth factor is greater than one.

B Growth. The growth factor is less than one.

C Decay. The growth factor is greater than one.

D Decay. The growth factor is less than one.

35 The expression $(x^4y^{-3})^{-2}$ can be rewritten as

A x^2y^{-5}

B x^2y^6

C $\frac{y^6}{x^8}$

D $\frac{x^{-8}}{y^6}$

36 A small business owner takes out a loan with an annual interest rate. Shown below is the expression the owner can use to determine the total amount of his loan.

$$P(1+r)^t$$

If the owner wants to change this expression so the interest is compounded quarterly, which expression would he use?

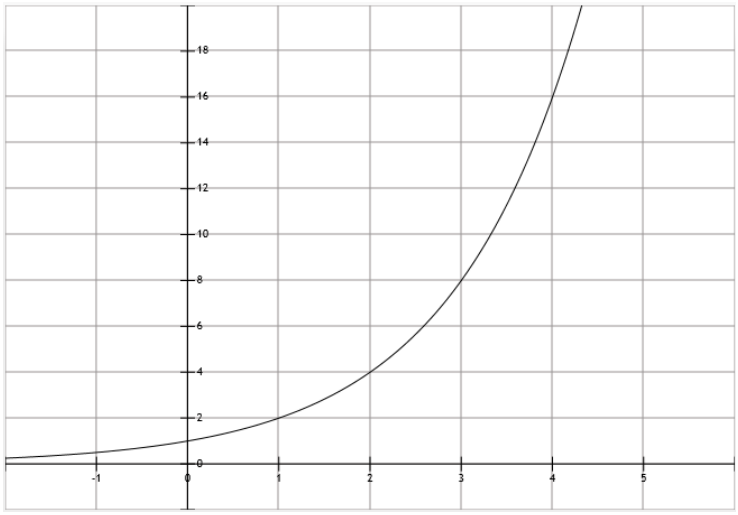
A $P\left(1+\frac{r}{4}\right)^t$

B $P\left(1+\frac{r}{4}\right)^{4t}$

C $P(1+4r)^{\frac{t}{4}}$

D $P(1+r)^{4t}$

37 What will be the function value at $x = 6$?



A 64

B 6

C 12

D 36

38 The value of a new car decreases exponentially. Suppose your mom buys a new car for $25,000. The value of the car decreases by 18% each year. Write an equation to model the value of the car x years after she buys it.

A $Y = 25{,}000(1.18)^x$

B $Y = 25{,}000(0.18)^x$

C $Y = 25{,}000(0.82x)$

D $Y = 25{,}000(0.82)^x$

39 Read the article at the right.

Suppose $24 had been invested in 1626 in an account paying 4.5% interest compounded annually. Which amount is closest to the balance in 2000?

Manhattan, Then and Now

In 1626, the Dutch landed on the island we now call Manhattan. They bought the island for $24 worth of merchandise. Today Manhattan is one of the most expensive places in the world to live. Rent for a one-bedroom apartment averages $2000 a month.

A $339 million

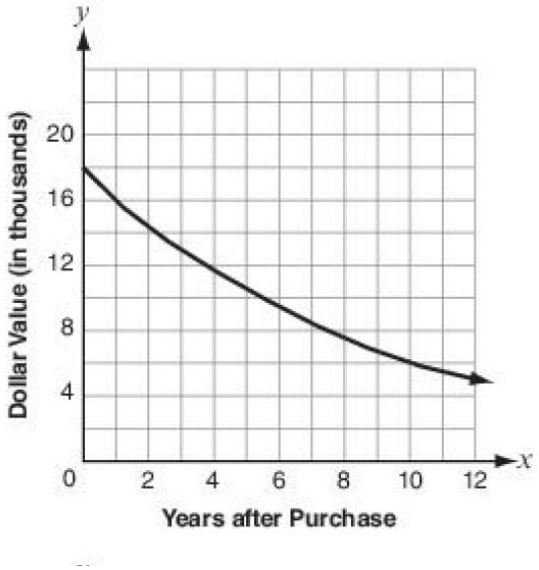
B $89 million

C $9400

D $8900

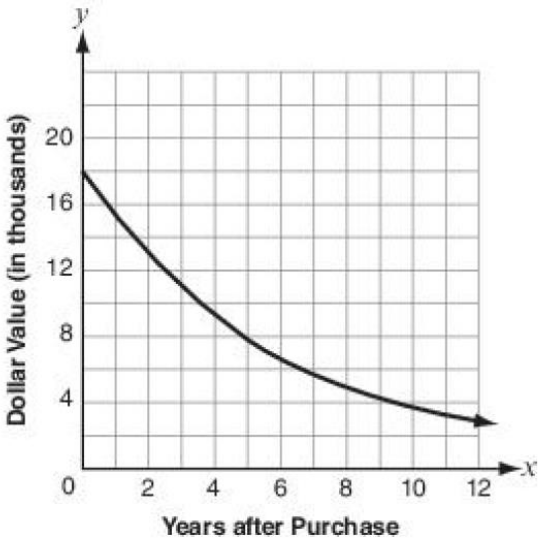
40 Olivia wants to purchase a new car for $18,000. She knows that after she purchases her car, it will depreciate (decrease in value) at a rate of 15% per year. Which graph models this situation?

A

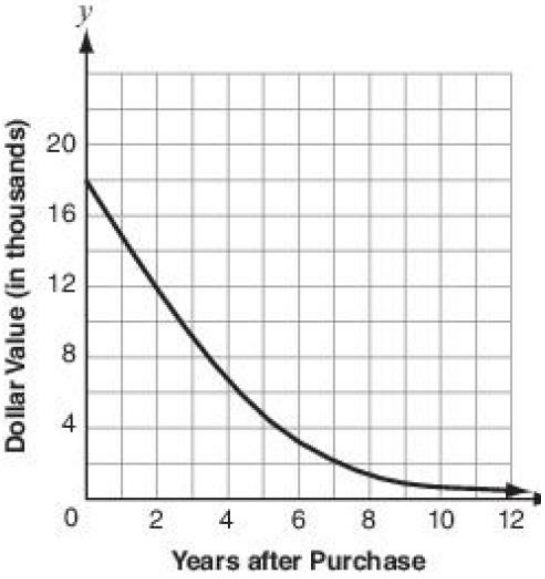


C

B



D



41 The table below shows how the number of bacteria on a kitchen counter changes over time.

Day	Number of Bacteria
0	100
1	200
2	400
3	800
4	1,600

Which equation represents the relationship between the day *(x)* and the number of bacteria *(y)*?

A $y = 200(2)^x$

B $y = 100(2)^x$

C $y = 100(2x)$

D $y = 200(x)^2$

42 Based on his records for his investments, John has determined that the equation $A = 610(1.0174)^x$ represents the amount of money in his bank account *x* years after he invested $610.

Which statement accurately describes the rate of change of John's account balance

A The account is losing value at a rate of 1.74% each year.

B The account is losing value at a rate 101.74% each year.

C The account is growing at a rate of 1.74% each year.

D The account is growing at a rate of 101.74% each year.

43 Ms. Ricks, the principal of a new school, kept track of the school's enrollment for the first four years. The results, which show an exponential relationship, are shown in the table below.

Year (f)	Number of Pupils (P)
0	230
1	248
2	268
3	290
4	313

A $P = 230(0.008)^t$

B $P = 230(1.008)^t$

C $P = 248(0.008)^t$

D $P = 248(1.008)^t$

44 Erik is playing a video game in which he moves his character to avoid obstacles while collecting coins to earn points. There are 10 levels in the game. The table below shows the number of points earned for each coin collected by his character while playing on an easy Level 1 as compared to playing on a more difficult Level 7.

Level 1

Coin	Points
1	5
2	105
3	205
4	305
5	405

Level 7

Coin	Points
1	5
2	10
3	20
4	40
5	80

If the patterns continue, what is the smallest coin number at which the points earned in Level 7 exceed the points earned in Level 1?

A 8 coins

B 9 coins

C 10 coins

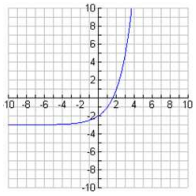
D 12 coins

Semester 1 Review Guide #1

1.	B	A.SSE.1a
2.	C	F.IF.1
3.	C	F.IF.1
4.	B	F.IF.2
5.	A	F.IF.4
6.	B	F.IF.5
7.	D	F.IF.6
8.	B	F.LE.5
9.	C	F.IF.5
10.	D	F.LE.1b
11.	C	F.LE.2
12.	D	A.CED.1 (Linear)
13.	C	A.CED.1 (Linear)
14.	B	A.CED.2
15.	C	A.CED.3
16.	B	A.CED.4
17.	B	A.REI.1 (Linear)
18.	C	A.REI.3
19.	C	A.REI.3
20.	B	F.IF.4
21.	A	F.IF.4
22.	B	A.REI.5
23.	D	A.REI.6
24.	D	A.REI.6
25.	C	A.REI.10
26.	C	A.REI.11
27.	D	F.IF.7a
28.	C	A.REI.12
29.	B	F.IF.7b
30.	B	F.IF.9
31.	D	F.IF.9
32.	A	F.LE.1b
33.	C	A.SSE.1a
34.	A	A.SSE.1b
35.	C	A.SSE.2
36.	B	A.SSE.3c
37.	A	A.CED.1 (Exponential)
38.	D	A.CED.2
39.	A	F.IF.2
40.	B	F.IF.7e
41.	B	F.IF.8b
42.	C	F.LE.1c
43.	B	F.LE.2
44.	B	F.LE.3

UCS JH Algebra I **REVIEW GD #2**

1 Which family of function does each graph belong?



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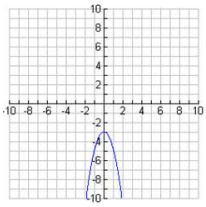

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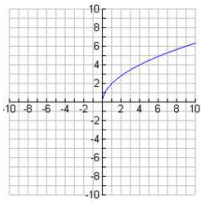

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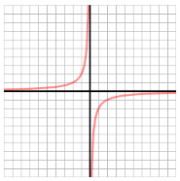

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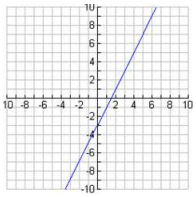

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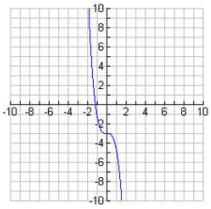

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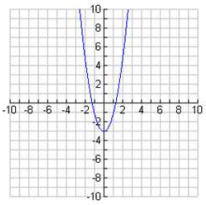

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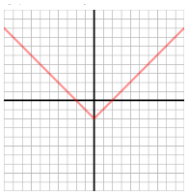


_____

A. Linear B. Quadratic C. Cubic D. Absolute Value
E. Exponential F. Inverse G. Square Root

2 The coach of a basketball team gathered data on each player's height, in inches, and shoe size. He organized the data using ordered pairs in the form (*Height, Shoe Size)* . The set of ordered pairs below shows this relation.

$$\left\{(72,12),\left(75,12\tfrac{1}{2}\right),(70,12),\left(73,11\tfrac{1}{2}\right),(75,13)\right\}$$

Is this relation a function? Explain your reasoning in terms of the definition of a function.

3 Which of the following represents a function? Which is not a function? Explain your reasoning:

A.

x	y
4	8
6	13
8	18
6	25
12	25

B.

x	y
4	9
6	13
8	17
10	21
12	25

4 a. A store bought a case of disposable cameras for $300.The store's profit on the cameras is a function of the number of cameras sold. Find the range of the function $p = 6c - 300$ when the domain is {0, 15, 50, 62}.

b. In this situation, what do the domain and range represent?

5 An economist predicts the relationship between the price of music CDs (p) and the number of CDs a customer is willing to buy (n) with this function.

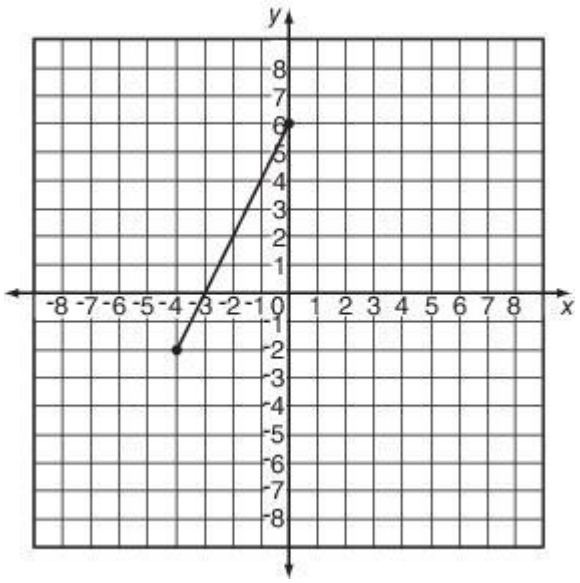
$p = -2n + 30$

According to this model, how many CDs is a customer willing to buy when the price is $20?

6 State the x- and y-intercepts for the following function.

$$3y - x = 15$$

7 State the domain and range of the following graph.



8 The table below shows the change in temperature over 12 hours.

Time (hours)	Temperature (°F)
0	13°
4	5°
8	−3°
12	−11°

What is the rate of change per hour?

9 At the Hamilton Doll Company, the cost of producing each Baby Anna doll is $12 plus $8 for clothes. The doll sells for $28, so the company uses the following profit function:

P(x) = 28x – (12 + 8)x

Where **x** represents the number of dolls sold. If the company decides to increase the doll's selling price to $32, what will be the **increase** in profit per doll?

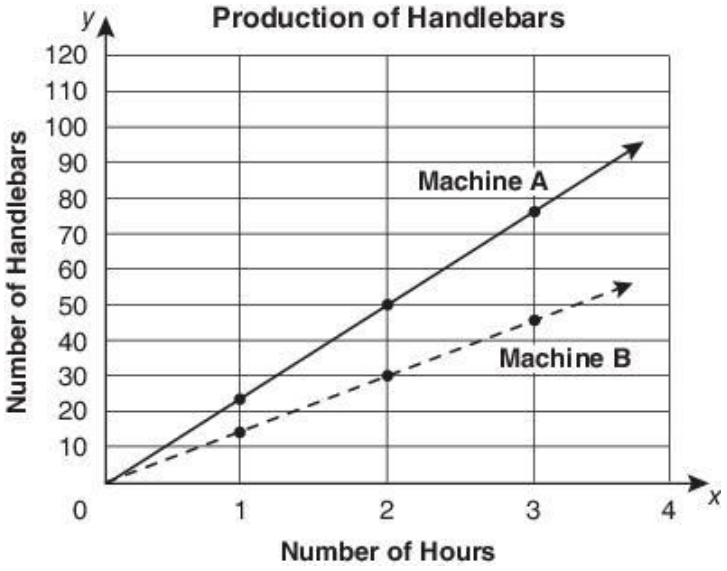
UNIT 2

10 An economist predicts the relationship between the price of music CDs (p) and the number of CDs a customer is willing to buy (n) with this function.

$$p = -2n + 30$$

According to this model, how many CDs is a customer willing to buy when the price is $20?

11 The number of cycle handlebars produced by two machines at a manufacturing plant is shown in the graph below.



If both machines are operating at the same time, how many hours will it take them to produce 700 handlebars?

12 State the domain and range of $y = 2^x$.

13 You have a cell phone plane that costs $50.00 per month, and it includes 100 text messages. Use the table below to calculate the cost for each additional text message after the first 100 messages.

Number of texts	0	100	125	150	200	500
Total bill	$50	$50	$53.75	$57.50	$65	$110

14 Shannon measures the height of a bamboo plant that grows at a constant rate. She records the height daily and records her measurements in the table below:

Day	12	13	14	15
Height (m)	0.9	1.05	1.20	1.35

On which day will the plant's height be double what its height was on Day 12?

15 The sign below shows the costs for one ice cream sundae with toppings.

Number of Topings	***C***
1	$3.25
2	$3.75
3	$4.25
4	$4.75

Which line shown corresponds to the ordered pairs (x, y) ?

A $c = 2.75t + 0.5$

B $c = 0.5t + 2.75$

C $c = 3.25t + 0.5$

D $c = 0.5t + 3.25$

UNIT 3

16 The width of a rectangular map is 12 inches more than the length and the perimeter is 60 inches. Find the length and the width.

17 A quadrilateral has a second side 3 more than the first side. The third side is 2 less than twice the first side and the fourth side is 6 more than the first side. The perimeter is 262 meters. Find the length of all four sides.

18 Larry runs at an average a rate of 8 miles per hour. He walks at an average rate of 3 miles per hour.

a. Let x = time running and y = time walking. Write an equation in standard form to relate the times he spends running and walking if he travels a distance of 15 miles.

b. Graph the equation

19 Suppose you have a job in an ice cream shop that pays $6 per hour. You also have a babysitting job that pays $4 per hour. You want to earn at least $60 per week but would like to work no more than 12 hours per week.
Write a system to model this situation.

20 A generic linear function written in standard form is shown below. Rewrite the equation solved for x.

$$Ax + By = C$$

21 Circle which step(s) contain an error based on the previous step.

$$\frac{1}{3}(x - 9) = -6$$

Step 1: $\frac{1}{3}x - 9 = -6$

Step 2: $\frac{1}{3}x = -6 + 9$

Step 3: $\frac{1}{3}x = 3$

Step 4: $x = 3 \div 3$

Step 5: $x = 1$

What is the correct solution?

22 What property is used in steps 1, 2, and 4?

Equation: $\frac{2}{3}(x-6)=5$

Step 1: $\frac{2}{3}x-4=5$ _____

Step 2: $\frac{2}{3}x-4+4=5+4$ _____

Step 3: $\frac{2}{3}x=9$

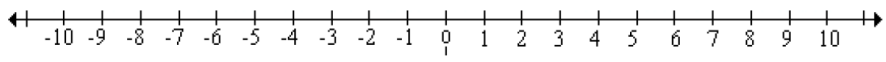
Step 4: $\frac{3}{2}\cdot\frac{2}{3}x=9\cdot\frac{3}{2}$ _____

Step 5: $x=\frac{27}{2}$

23 Find the solutions for the following inequality. Graph the solution.

$$4-6x\geq -32$$

Solution_____



24 Determine whether the following equations are parallel, perpendicular, or neither to the following equation.

$$2x+3y=8$$

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

b. $-3x+2y=14$

c. $6x+4y=20$

d. $y-5=\frac{3}{2}(x+4)$

e. $4x-6y=24$

f. $y+3=-\frac{2}{3}(x-7)$

25 When you exercise, your pulse rate rises. Recommended pulse rates vary with age and physical condition. For vigorous exercise, such as jogging, the inequality $0.7 \leq \frac{R}{(220-a)} \leq 0.85$ gives a target range for pulse rate R (in beats per minute), based on age a (in years).

a. What is the target range for pulse rates for a person 35 years old? Round to the nearest whole number and write your answer as a compound inequality.

b. Your cousin's target pulse rate is in the range between 140 and 170 beats per minute. What is your cousin's age?

26 Two systems of linear equations are shown below.

$$\begin{cases} \frac{x}{2} - \frac{y}{3} = 1 \\ -3x + y = 12 \end{cases}$$

Which of these represents a step in using elimination to create an equivalent system of equations with the same solutions?

A
$$\begin{array}{r} 3x - 2y = 6 \\ \underline{+(3x + y = 12)} \\ -y = 18 \end{array}$$

B
$$\begin{array}{r} 3x - 2y = 6 \\ \underline{-(3x - y = -12)} \\ -y = 18 \end{array}$$

C
$$\begin{array}{r} 3x - 2y = 6 \\ \underline{+(3x - y = 12)} \\ -3y = 18 \end{array}$$

D
$$\begin{array}{r} 3x - 2y = 6 \\ \underline{-(3x + y = -12)} \\ -y = -6 \end{array}$$

27 *How many* solutions does the following system of linear equations have?

$$5x + 2y = 16$$
$$10x + 4y = 12$$

28 Solve the system of equations.

$$2x + 9y = -1$$
$$-x + 9y = 14$$

29 Name 5 ordered pairs that satisfy the equation $y = \frac{3}{4}x - 9$.

30 Two groups of students order burritos and tacos at a local restaurant. One order of 3 burritos and 4 tacos costs $11.33.The other order of 9 burritos and 5 tacos costs $23.56.

a. Write a system of equations that describes this situation.

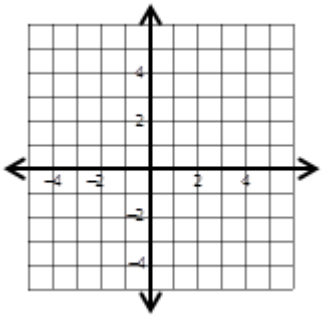
b. Solve by elimination to find the cost of a burrito and the cost of a taco.

31 Graph the inequality: $2y < x + 2$

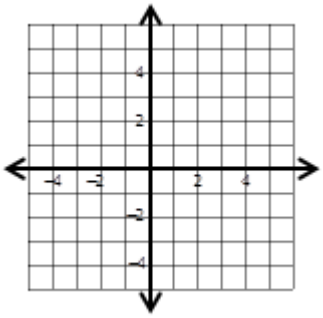
32 The Incredibles are on vacation in Virginia Beach which is 724 miles away from their home in Detroit. When they return home, they are traveling at an average speed of 60 mph. What is the x-intercept, y-intercept and what do each represent.

33 Graph the following equations.

$y = |x - 1| - 2$



$y = -|x + 3| + 4$



34 Which equation has a *y*-intercept at 5 and is perpendicular to the line passing through the points $(-1, -5)$ and $(4, 3)$?

35 Determine if the following lines are parallel, perpendicular, or neither.

$$5x + 2y = 18$$

$$-4y = 10x - 20$$

36

Jennifer wrote this equation to model how she expects the price, *p* , of a stock will change:

$$p = -0.25w + 15$$

A As *w* increases, the value of *p* increases

B As *w* increases, the value of *p* decreases

C As *w* increases, the value of *p* stays the same

D As *w* increases, the value of *p* increases on some days

UNIT 4

37 Name the coefficients and constants for the following expressions

a) $8x^7 - 14x^5 + 34x^3 - x^2 + 54$

Coefficients: _____

Constants: _____

b) $5x^2$

Coefficients: _____

Constants: _____

38 Describe each function as either a growth or decay. Explain which number represents the growth or decay, why? Explain what the other number in the function represents.

a) $f(x) = 9\left(\frac{1}{4}\right)^x$

b) $f(x) = \frac{3}{4}(7)^x$

39 The expression $(x^3y^2)^{-3}$ can be simplified as?

40 You have saved $800 from your babysitting job. You decide to invest your money in an account that has a semi-annual interest rate of 4%. Write an expression to show how much money will be in your account when you graduate from high school in 5.5 years. How much money will you have?

41 Mr. Miller owns an apple orchard. He offers his workers two possible payment plans.
Option A is $1.50 per bushel of apples
Option B is 1¢ if you pick one bushel, 3¢ if you pick two bushels, 9¢ if you pick three bushels and so on, tripling for each additional bushel you pick.

If you only have enough time to pick 6 bushels, which plan should you choose? Why?

If you have enough time to pick 9 bushels, which plan should you choose? Why?

42 In 2012 the population of Sterling Heights was 130,410. Its population is increasing by 1.6% per year. Write an equation to model the population growth of Sterling Heights since the year 2012.

43 Simplify the following expression.

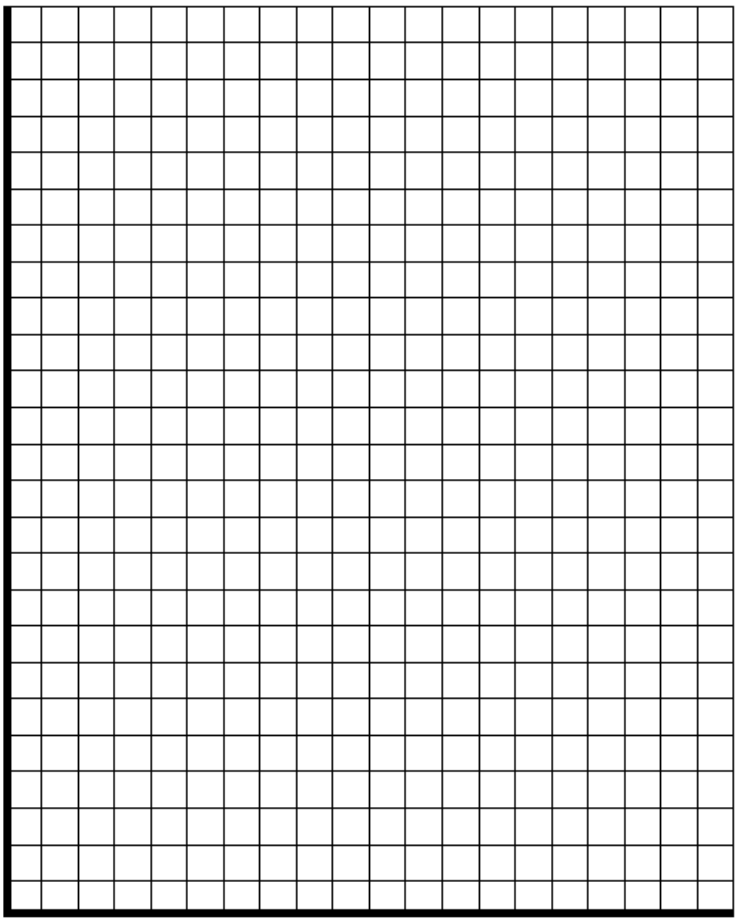
$$\frac{E \cdot 32^5}{E \cdot 32^{2.7}}$$

44 Since 1990, the population of Virginia has grown at an average annual rate of about 1%. In 1990, the population was about 6,284,000.

a. Write an equation to model the population growth in Virginia since 1990.

b. Suppose this rate of growth continues. Predict Virginia's population in 2010.

45 Jennifer deposits $200 into a savings account that earns 6% annual interest, compounded **monthly**. This is modeled by the function $\mathbf{y = 200(1.005)^{12t}}$. Graph this function to model Jennifer's savings over 10 years. What is the y-intercept of the graph? What does the y-intercept mean in terms of Jennifer's savings account?



46 Suppose two mice live in a barn. If the number of mice doubles every month, how many mice will be in the barn after 6 months?

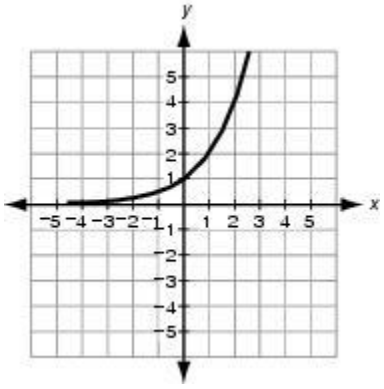
A) Create a table of values with *(x)* representing the number of months and *(y)* representing the number of mice.

B) Create an equation that represents the relationship between the month *(x)* and the number of mice *(y).*

47 Based on his records for his investments, Tom has determined that the equation $A = 734(1.0512)^x$ represents the amount of money in his bank account ***x*** years after he invested \$734.

Describe the rate of change of Tom's account balance

48 Which equation BEST describes the graph below?



A $f(x) = x$

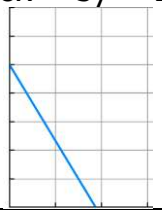
B $f(x) = x^2$

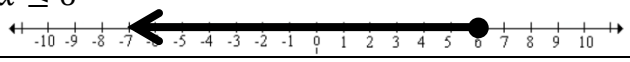
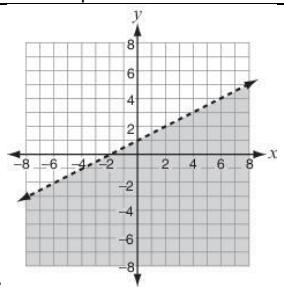
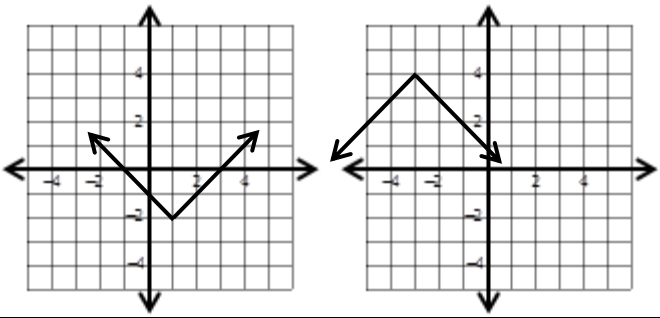
C $f(x) = 2^x$

D $f(x) = \left(\frac{1}{2}\right)^x$

49 Two functions are defined as follows: $f(x) = 100x$ and $g(x) = 2(3)^x$

For which integers, x, does the value of $g(x)$ exceed the value of $f(x)$?

#	Standard	Answer
1	**A.SSE.1a**	E B G F A C B D
2	**F.IF.1**	The relation is not a function because one height matches to more than one shoe size.
3	**F.IF.1**	A is not a function: "6" in the domain maps to two different range values. B is s function: each range has a unique domain.
4	**F.IF.2**	a) {-300, -210, 0, 72} b) D: # of cameras sold R: amount of profit
5	**F.IF.4**	5 CDs
6	**F.IF.4**	(–15, 0) and (0, 5)
7	**F.IF.5**	Domain $-4 \leq x \leq 0$ Range $-2 \leq y \leq 6$
8	**F.IF.6**	-2 degrees
9	**F.LE.5**	Answer: $4 per doll. (New profit is $12 per doll, old profit was $8 per doll, for an increase of $4 per doll)
10	**F.IF.4**	5 CDs
11	**F.IF.4**	17.5 hours
12	**F.IF.5**	Domain: All Real Numbers Range : $y > 0$
13	**F.LE.1b**	$0.15
14	**F.LE.1b**	18
15	**F.LE.2**	B
16	**A.CED.1 (Linear)**	length is 9 inches width is 21 inches
17	**A.CED.1 (Linear)**	51 x 54 x 100 x 57
18	**A.CED.2**	8x + 3y = 15 
19	**A.CED.3**	Let c = hours in ice cream shop and let b = hours babysitting. $6c + 4b \geq 60$ $c + b \leq 12$
20	**A.CED.4**	$x = \frac{C - By}{A}$
21	**A.REI.1**	Steps 1 and 4 have errors; x = -9

22	**A.CED.1 (Linear)**	1: Distributive 2: Addition Prop of Equality 4: Inverse Prop. Of Mult.
23	**A.REI.3**	$x \leq 6$ 
24	**F.IF.4**	a)||, b)⊥, c)neither d) ⊥ e)neither, f)||
25	**A.REI.3**	a) $130 \leq R \leq 157$ b) 20 yrs. old
26	**A.REI.5**	B
27	**A.REI.6**	zero
28	**A.REI.6**	(-5, 1)
29	**A.REI.10**	Answers may vary. Samples (0, -9) (4, -6) (8, -3)
30	**A.REI.11**	a) $3b + 4t = 11.33$ $9b + 5t = 23.56$ b) Burrito =$1.79, Taco = $1.49
31	**A.REI.12**	 solve for y: $y < \frac{1}{2}x + 1$
32	**F.IF.7a**	x-intercept = 12.1 hours (12 hours 4 minutes) time it takes to reach their home. y-intercept = they start 724 miles away from home.
33	**F.IF.7b**	
34	**F.IF.9**	$y = \frac{-5}{8}x + 5$
35	**F.IF.9**	Parallel
36	**F.LE.1b**	B

<table>
<tr><td>37</td><td>A.SSE.1a</td><td>a) Coef: 8, -14,34,-1
a) Const: 54
b) Coef: 5
b) Const: 0</td></tr>
<tr><td>38</td><td>A.SSE.1b</td><td>a) Decay, decay factor of ¼ is less than one. 9 is the initial value
b) Growth, growth factor of 7 is greater than one. ¾ is the initial value.</td></tr>
<tr><td>39</td><td>A.SSE.2</td><td>$\frac{1}{x^9y^6}$</td></tr>
<tr><td>40</td><td>A.SSE.3c</td><td>$800(1.02)^{11}$ = $944.70</td></tr>
<tr><td>41</td><td>A.CED.1 (Exponential)</td><td>6 bushels Option A $9 > $2.43
9 bushels Option B $65.61 > $13.50</td></tr>
<tr><td>42</td><td>A.CED.2</td><td>y = 130,410(1.016)^x</td></tr>
<tr><td>43</td><td>A.REI.1</td><td>$32^{2.3} = 2{,}986.3$</td></tr>
<tr><td>44</td><td>F.IF.2</td><td>a) $y = 6{,}284{,}000(1.01)^x$
b) 7,667,674</td></tr>
<tr><td>45</td><td>F.IF.7e</td><td>y-intercept is 200, this is Jennifer's initial deposit. Check graph on a graphing calculator.</td></tr>
<tr><td>46</td><td>F.IF.8b</td><td>Answer.
$B)\ y = 2(2)^x$
A)
<table><tr><th>Month</th><th>Number of Mice</th></tr><tr><td>0</td><td>2</td></tr><tr><td>1</td><td>4</td></tr><tr><td>2</td><td>8</td></tr><tr><td>3</td><td>16</td></tr><tr><td>4</td><td>32</td></tr><tr><td>5</td><td>64</td></tr><tr><td>6</td><td>128</td></tr></table></td></tr>
<tr><td>47</td><td>F.LE.1c</td><td>The account is growing at a rate of 5.12% each year</td></tr>
<tr><td>48</td><td>F.LE.2</td><td>C</td></tr>
<tr><td>49</td><td>F.LE.3</td><td>$x \geq 6$</td></tr>
</table>