8.1

READY, SET, GO! **Name** **Period** **Date**

READY

Topic: Finding the distance between two points

Use the number line to find the distance between the given points. (The notation AB means the distance between the points A and B.)

1. AE
Answer: 6

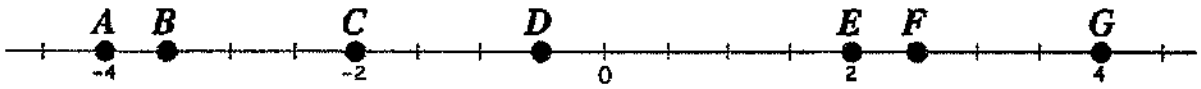
2. CF
[redacted]

3. GB
Answer: 7.5

4. CA
[redacted]

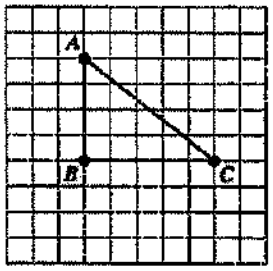
5. BF
Answer: 6

6. EG
[redacted]



7. Describe a way to find the distance between two points on a number line without counting the spaces.

Answer: Subtract the points. If the difference is negative, change it to positive since distance is always positive.

8. 

a. Find AB. [redacted]

b. Find BC. [redacted]

c. Find AC. [redacted]

9. Why is it easier to find the distance between point A and point B and point B and point C than it is to find the distance between point A and point C?

Answer: AB and BC are vertical and horizontal segments so all you have to do is count the spaces along the grid lines. A slanted line needs Pythagorean Theorem.

10. Explain how to find the distance between point A and point C.

Answer: [redacted]

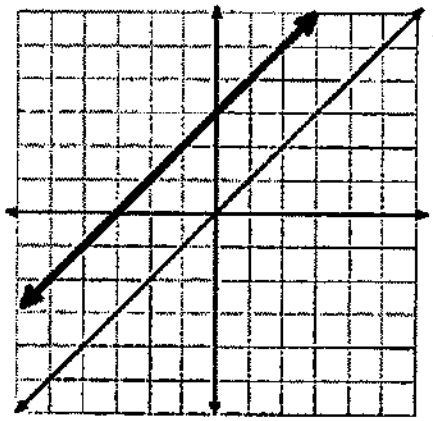
mathematics vision project

8.2

READY, SET, GO! **Name** **Period** **Date**

READY

Topic: Using translations to graph lines



The equation of the line in the graph is $y = x$.

1. a) On the same grid graph a parallel line that is 3 units above it.

   b) Write the equation for the new line in slope-intercept form.

   Answer: $y = x + 3$

   c) Write the y-intercept of the new line as an ordered pair.

   Answer: $(0, 3)$

   d) Write the x-intercept of the new line as an ordered pair.

   Answer: $(-3, 0)$

   e) Write the equation of the new line in point-slope form using the *y-intercept.*

   Answer: $y = (x - 0) + 3$

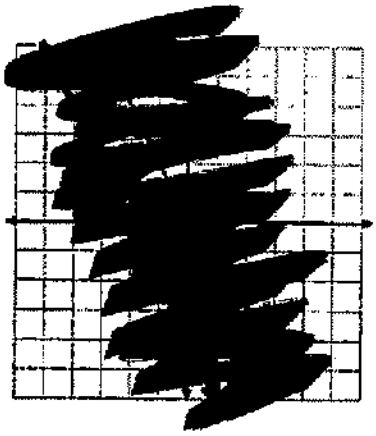
   f) Write the equation of the new line in point-slope form using the *x-intercept.*

   Answer: $y = (x + 3) + 0$

   g) Explain in what way the equations are the same and in what way they are different.

   Answer: They have the same form and the same slope. When using the x intercept, the parentheses are effected. When using the y intercept, the end number is effected.

The graph at the right shows the line $y = -2x$.



2. a) On the same grid, graph a parallel line that is 4 units below it.

   b) Write the equation of the new line in slope-intercept form.

   A[redacted]

   c) Write the y-intercept of the new line as an ordered pair.

   Answer:[redacted]

   d) Write the x-intercept of the new line as an ordered pair.

   Answer:[redacted]

   e) Write the equation of the new line in point-slope form using the *y-intercept.*

   Answer[redacted]

   f) Write the equation of the new line in point-slope form using the *x-intercept.*

   Answer:[redacted]

   g) Explain in what way the equations are the same and in what way they are different.

   Answer:[redacted]

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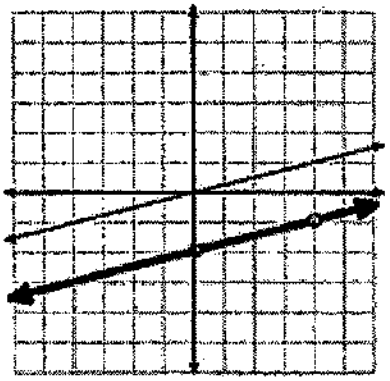
The graph at the right shows the line $y = \frac{1}{4}x$.



3. a) On the same grid, graph a parallel line that is 2 units below it.

   b) Write the equation of the new line in slope-intercept form.

   Answer: $y = \frac{1}{4}x - 2$

   c) Write the y-intercept of the new line as an ordered pair.

   Answer: $(0, -2)$

   d) Write the x-intercept of the new line as an ordered pair.

   Answer: $(0, 8)$

   e) Write the equation of the new line in point-slope form using the *y-intercept*.

   Answer: $y = \frac{1}{4}(x - 0) - 2$

   f) Write the equation of the new line in point-slope form using the *x-intercept*.

   Answer: $y = \frac{1}{4}(x - 8) + 0$

   g) Explain in what way the equations are the same and in what way they are different.

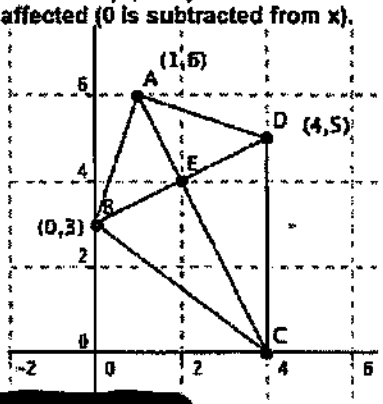
Answer: They have the same form and the same slope. When using the x intercept, the parentheses are affected (0 is added on the end). When using the y intercept, the end number is affected (0 is subtracted from x).

SET

Topic: Verifying and proving geometric relationships

The quadrilateral at the right is called a **kite.**
Complete the mathematical statements about the kite using the given symbols. Prove each statement algebraically. (A symbol may be used more than once.)

$\cong \quad \perp \quad \parallel \quad < \quad > \quad =$



Proof

4. $\overline{BC}$ [redacted] $\overline{DC}$

5. $\overline{BD}$ $\perp$ $\overline{AC}$

   Answer: $\overline{BD}$ has slope of $\frac{1}{2}$, $\overline{AC}$ has a slope of -2.

6. $\overline{AB}$ [redacted] $\overline{BC}$

   Answer: [redacted]

mathematics vision project

7. $\Delta ABC \cong \Delta ADC$

Answer: $AB = \sqrt{10}$, $AD = \sqrt{10}$ $(1^2 + 3^2 = c^2)$, $BC = 5 = DC$, and $AC = AC$ (shared); congruent because of SSS.

8. $\overline{BE}$ [redacted] $\overline{ED}$

Answer: [redacted]

9. $\overline{AE} > \overline{ED}$

Answer: $AE = \sqrt{5}$ $(1^2 + 2^2 = c^2)$ and $EC = \sqrt{20} = 2\sqrt{5}$ $(4^2 + 2^2 = c^2)$

10. $\overline{AC}$ [redacted] $\overline{BD}$

Answer: [redacted]

GO

Topic: Writing equations of lines

Use the given information to write the equation of the line in standard form. $(Ax + By = C)$

11. *Slope:* $-\frac{1}{4}$ *point* $(12, 5)$

Answer: $x + 4y = 32$

12. $P(11, -3)$, $Q(6, 2)$

Answer: [redacted]

13. $x - intercept: -2$; $y - intercept: -3$

Answer: $3x + 2y = -6$

14. *All x values are* (-7). *Y is any number.*

Answer: [redacted]

15. *Slope:* $\frac{1}{2}$; $x - intercept: 5$

Answer: $x - 2y = 5$

16. $E(-10, 17)$, $G(13, 17)$

Answer: [redacted]

SECONDARY MATH 1 // MODULE 8
CONNECTING ALGEBRA & GEOMETRY – 8.3

8.3

READY, SET, GO! **Name** **Period** **Date**

READY

Topic: Interpreting tables of value as ordered pairs.

Find the value of $f(x)$ for the given domain. Write x and $f(x)$ as an ordered pair.

1. $f(x) = 3x - 2$

x	$f(x)$	$(x, f(x))$
-2	-8	(-2,-8)
-1	-5	(-1,-5)
0	-2	(0,-2)
1	1	(1,1)
2	4	(2,4)

2. $f(x) = x^2$

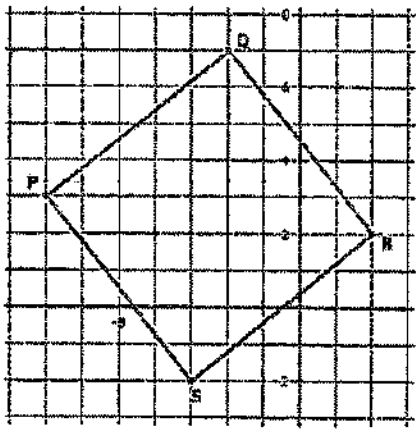
x	$f(x)$	$(x, f(x))$
-2	[redacted]	
-1		
0		
1		
2		

3. $f(x) = 5^x$

x	$f(x)$	$(x, f(x))$
-2	$1/5$	$(-2, 1/25)$
-1	$1/25$	$(-1, 1/5)$
0	1	(0,1)
1	5	(1,5)
2	25	(2,25)

SET

Topic: Identifying specific quadrilaterals



4. a) Is the figure at the right a rectangle? Justify your answer.

Answer: T[redacted]

b) Is the figure at the right a rhombus? Justify your answer.

A[redacted]

c) Is the figure at the right a square? Justify your answer.

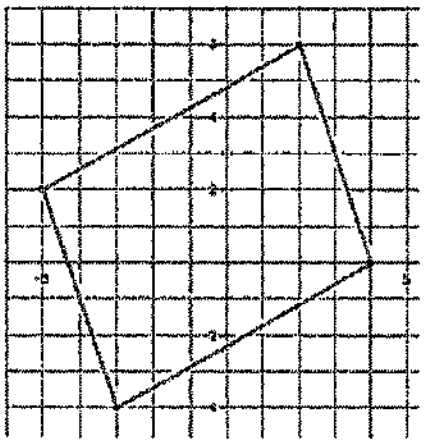
A[redacted]

mathematics vision project

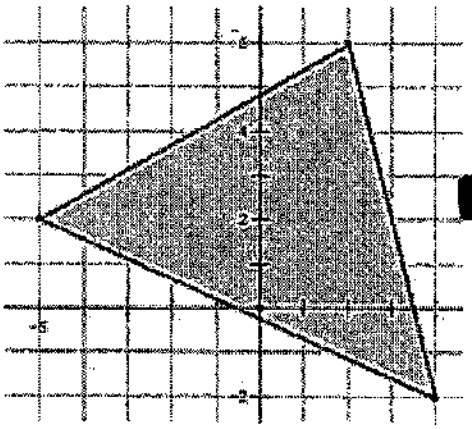
GO

Topic: Calculating perimeters of geometric shapes

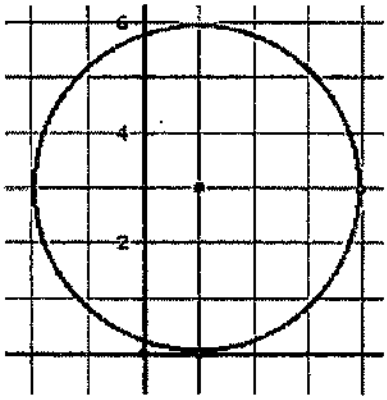
Find the perimeter of each figure below. Round answers to the nearest hundredth.

5. 

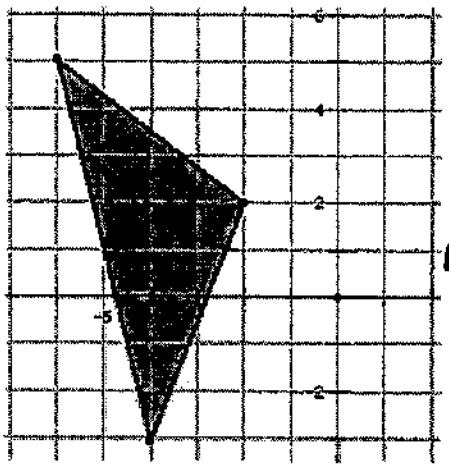
Answer: 28.77

6. 

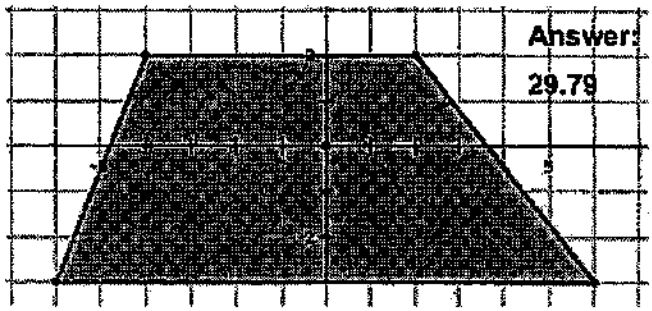
Answer: [redacted]

7. 

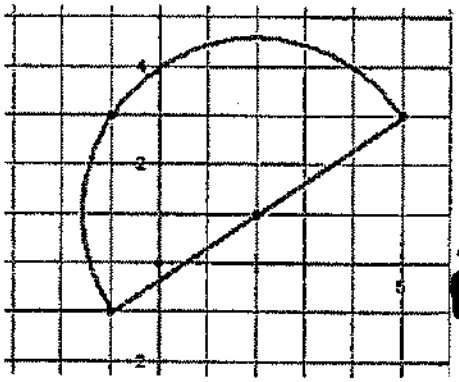
Answer: 18.85

8. 

Answer: [redacted]

9. 

Answer: 29.79

10. 

Answer: [redacted]

8.4

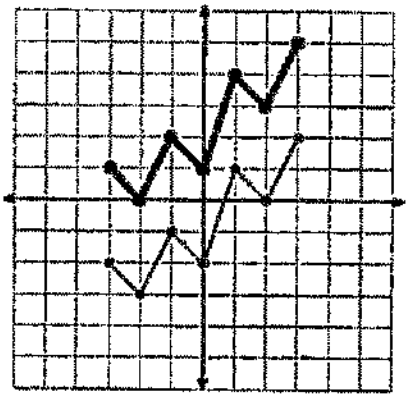
READY, SET, GO!

Name Period Date

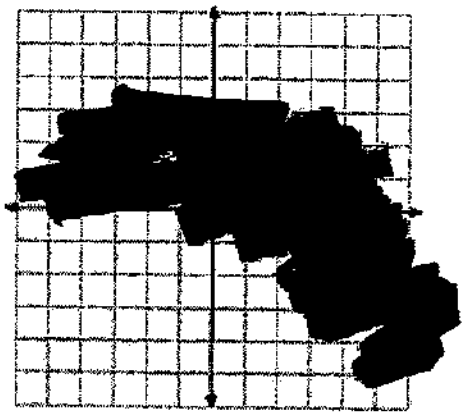
READY

Topic: Vertical transformations on graphs

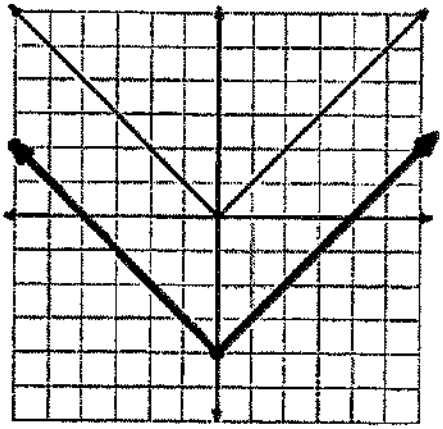
1. Use the graph below to draw a new graph that is translated up 3 units.



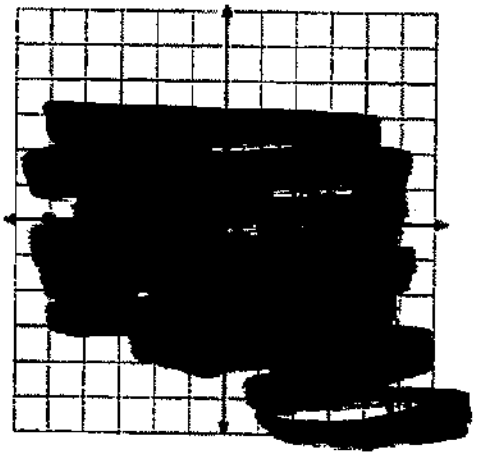
2. Use the graph below to draw a new graph that is translated down 1 unit.



3. Use the graph below to draw a new graph that is translated down 4 units.



4. Use the graph below to draw a new graph that is translated down 3 units.



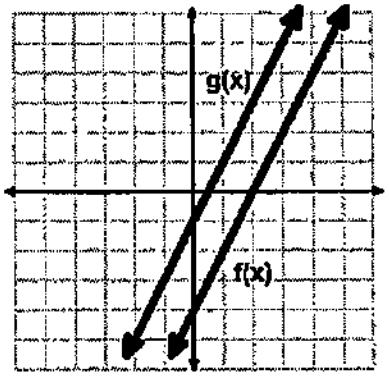
mathematics vision project

SET

Topic: Graphing transformations and writing the equation of the new graph

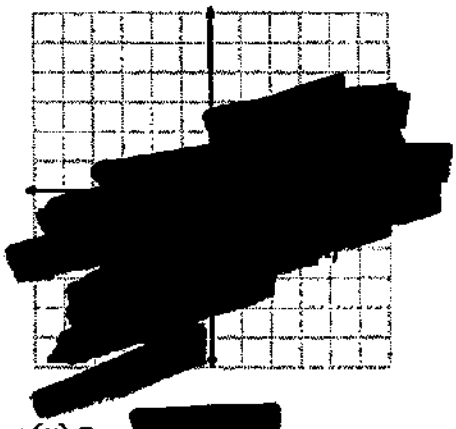
You have been given the equations of $f(x)$ and the transformation $g(x) = f(x) + k$. Graph both $f(x)$ and $g(x)$. Then write the linear equation for $g(x)$ in the space provided.

5. $f(x) = 2x - 4$; $g(x) = f(x) + 3$



$g(x) =$ $2x - 1$

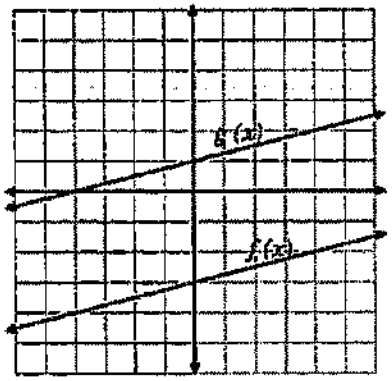
6. $f(x) = 0.5x$; $g(x) = f(x) - 3$



$g(x) =$ [redacted]

Based on the given graph, write the equation of $g(x)$ in the form of $g(x) = f(x) + k$. Then simplify the equation of $g(x)$ into slope-intercept form. The equations of $f(x)$ is given.

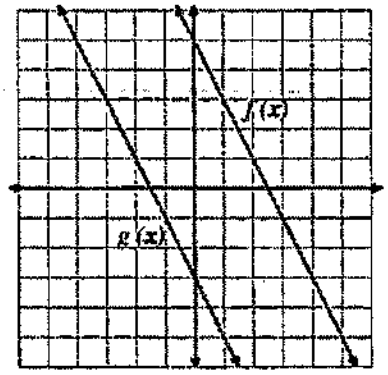
7. $f(x) = \frac{1}{4}x - 3$



a. $g(x) =$ $f(x) + 4$
Translation form

b. $g(x) =$ $\frac{1}{4}x + 1$
Slope-intercept form

8. $f(x) = -2x + 5$



a. $g(x) =$ [redacted]
Translation form

b. $g(x) =$ [redacted]
Slope-intercept form

GO

Topic: Converting units and making decisions based on data

9. Fernando and Mariah are training for a half marathon. The chart below describes their workouts for the week just before the half marathon. A half marathon is equal to 13.1 miles. If four laps make up one mile, do you think Mariah and Fernando are prepared for the event?

   Describe how you think each person will perform in the race. Include who you think will finish first and predict what you think each person's finish time will be. Use the data to inform your conclusions and to justify your answers.

Day of the week	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Fernando: Distance (in laps)	34	45	52	28	49	36
Time per day (in minutes)	60	72	112	63	88	58
Mariah: Distance (in laps)	30	48	55	44	38	22
Time per day (in minutes)	59	75	119	82	70	45

Answers will vary. Possible points that could be made to answer the problem:

- **Fernando and Mariah are both prepared since on Wednesday, he ran 13 miles and Mariah ran more than 13 miles.**
- **Fernando's average pace is .546 per minute and Mariah's average pace is .53 per minute.**
- **Fernando will probably beat Mariah since he runs a little bit further per minute than Mariah.**
- **Fernando's time will be about 95 minutes and Mariah's time should be about 98 minutes.**

8.5

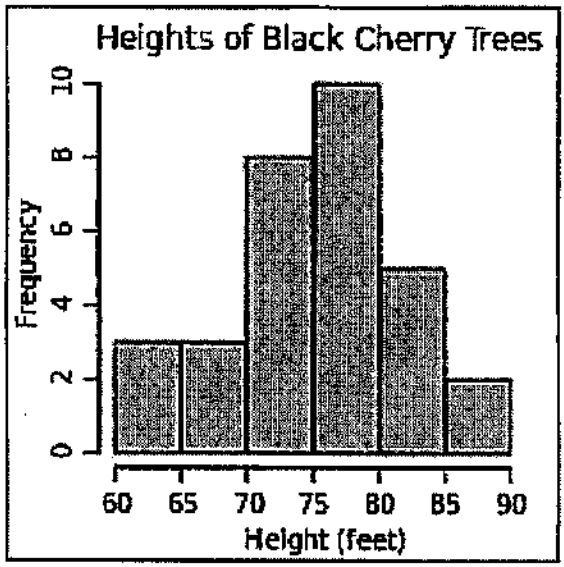
READY, SET, GO!

Name Period Date

READY

Topic: Describing spread.

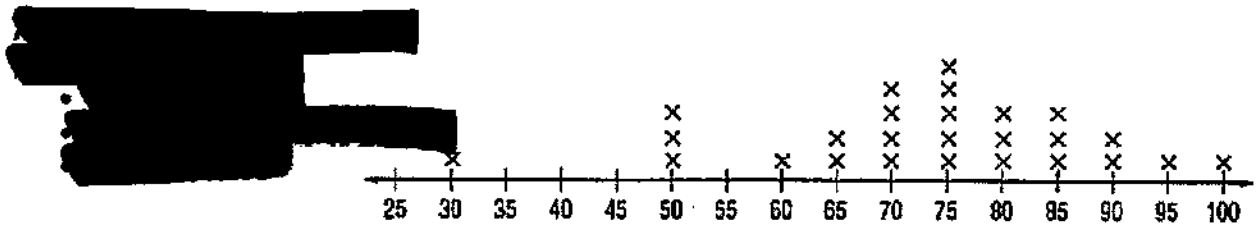
1. Describe the spread in the histogram below.



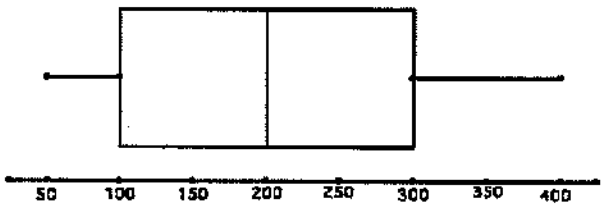
https://commons.wikimedia.org/wiki/File:Black_cherry_tree

Answers may vary. Possible points to consider:
- **Range is 30**
- **Unimodal**
- **Somewhat symmetrical**
- **Extremes at 60 and 90**

2. Describe the spread in the line plot below.



3. Describe the spread in the box and whisker plot.



Answers may vary. Possible points to consider:
- **Range is 350**
- **No outliers**
- **Interquartile range 200**
- **Extremes at 50 and 400**

mathematics vision project

SET

Topic: Writing functions in translation form.

You are given information about $f(x)$ and $g(x)$.
Rewrite $g(x)$ in translation form: $g(x) = f(x) + k$

4. $f(x) = 7x + 13$
$g(x) = 7x - 5$

Answer:
$g(x) =$ [redacted]
Translation form

5. $f(x) = 22x - 12$
$g(x) = 22x + 213$

Answer:
$g(x) = f(x) + 225$
Translation form

6. $f(x) = -15x + 305$
$g(x) = -15x - 11$

Answer:
$g(x) =$ [redacted]
Translation form

7.

x	f(x)	g(x)
3	11	26
10	46	61
25	121	136
40	196	211

Answer:
$g(x) = f(x) + 15$
Translation form

8.

x	f(x)	g(x)
-4	5	-42
-1	-1	-48
5	-13	-60
20	-43	-90

Answer:
$g(x) =$ [redacted]
Translation form

9.

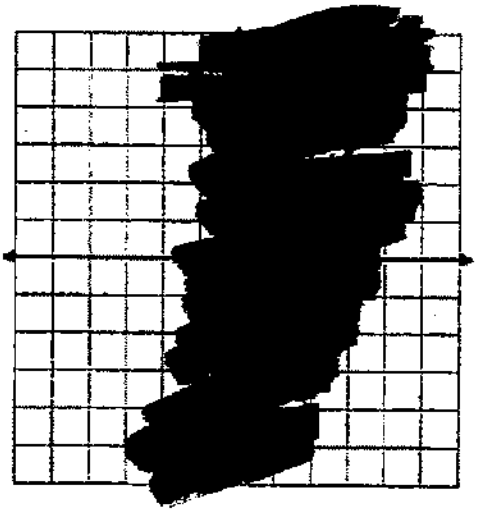
x	f(x)	g(x)
-10	4	-15.5
-3	7.5	-12
22	20	0.5
41	29.5	10

Answer:
$g(x) = f(x) - 19.5$
Translation form

GO

Topic: Vertical and horizontal translations.

10. Use the graph of $f(x) = 3x$ to do the following:



a. Sketch the graph of $g(x) = 3x - 2$ on the same grid.

b. Sketch the graph of $h(x) = 3(x - 2)$

c. Describe how $f(x), g(x), and\ h(x)$ are different and how they are the same.

Answer: [redacted]

d. Explain in what way the parentheses affect the graph. Why do you think this is so?

[redacted]

mathematics vision project

8.6

READY, SET, GO! Name Period Date

READY

Topic: Finding percentages

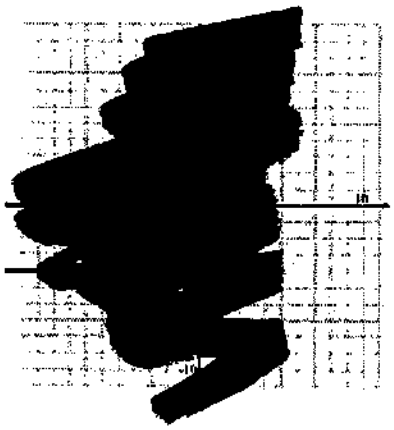
Mrs. Gonzalez noticed that her new chorus class had a lot more girls than boys in it. There were 32 girls and 17 boys. (Round answers to the nearest %.)

1. What percent of the class are girls?
   Answer: 65%
2. What percent are boys?
   [redacted]
3. 68% of the girls were sopranos.
   a. How many girls sang soprano?
   Answer: 22 girls
   b. What percent of the entire chorus sang soprano?
   Answer: 49%
4. Only 30% of the boys could sing bass.
   a. How many boys were in the bass section?
   [redacted]
   b. What percent of the entire chorus sang bass?
   [redacted]
5. Compare the number of girls who sang alto to the number of boys who sang tenor. Which musical section is larger? **Altos** Justify your answer.
   Answer: Altos → 32-22=10, 10/49 = 20% Tenor→ 17-5=12, 12/49 = 24%

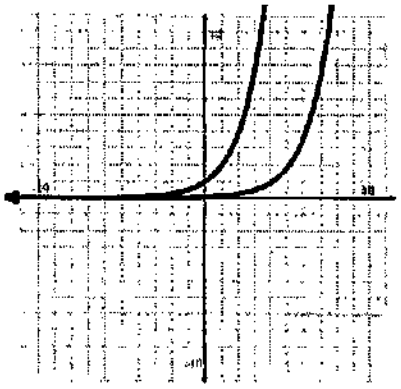
SET

Topic: Graphing exponential equations.

6. Think about the graphs of $y = 2^x$ and $y = 2^x - 4$.
   a. Predict what you think is the same and what is different.
   Answers may vary. Po [redacted]
   b. Use your calculator to graph both equations on the same grid. Explain what stayed the same and what changed when you subtracted 4. Identify in what way it changed. (If you don't have a graphing calculator, this can easily be done by hand.)
   [redacted]



7. Think about the graphs of $y = 2^x$ and $y = 2^{(x-4)}$.



a. Predict what you think is the same and what is different.

Answers may vary. Possible answers: They would have the same shape but the second one is 4 spaces to the right.

b. Use your calculator to graph both equations on the same grid. Explain what stayed the same and what changed. Identify in what way it changed.

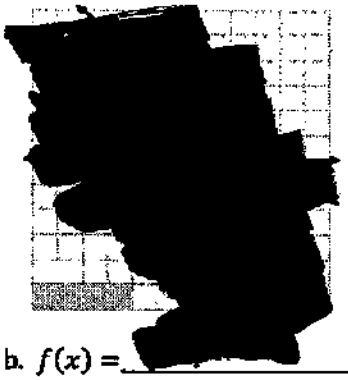
Answers: They would have the same shape but the second one is 4 spaces to the right.

GO

Topic: Vertical translations of linear equations

The graph of $f(x)$ and the translation form equation of $g(x)$ are given. Graph $g(x)$ on the same grid as $f(x)$ and write the slope-intercept equation of $f(x)$ and $g(x)$.

8. $g(x) = f(x) - 5$

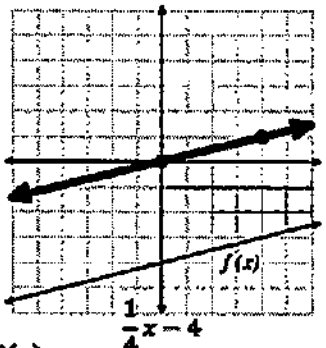


b. $f(x) =$ _____

c. $g(x) =$ _____
Slope-intercept form

9. $g(x) = f(x) + 4$

a.

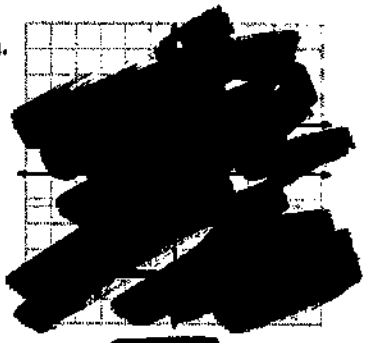


b. $f(x) = \frac{1}{4}x - 4$

c. $g(x) = \frac{1}{4}x$
Slope-intercept form

10. $g(x) = f(x) - 6$

a.



b. $f(x) =$ _____

c. $g(x) =$ _____
Slope-intercept form