Released Algebra Exit Exam Items

Student Name: _____

The items below have been used on past administrations of the Algebra Exit Exam. This collection of released items does not represent a full length exam, both in the number of items and the assessment of specific standards. Rather, these items provide an opportunity for students and teachers to become more familiar with the type of questions on the Algebra Exit Exam.

DO YOUR FIGURING HERE

1. Which of the following is a true statement about the graph of the linear equation $-3y = -8x + 12$?

   a. The slope of any line perpendicular to this line is $\frac{3}{8}$.
   b. The line intersects the y–axis at a positive value.
   c. As the value of x increases, the value of y decreases.
   d. The x–intercept is $\frac{3}{2}$.

2. In the expansion of $(2x^4 + 3x^2)(x^2 - 1)$ what is the coefficient of x^4?

   a. -5
   b. 1
   c. 3
   d. 5

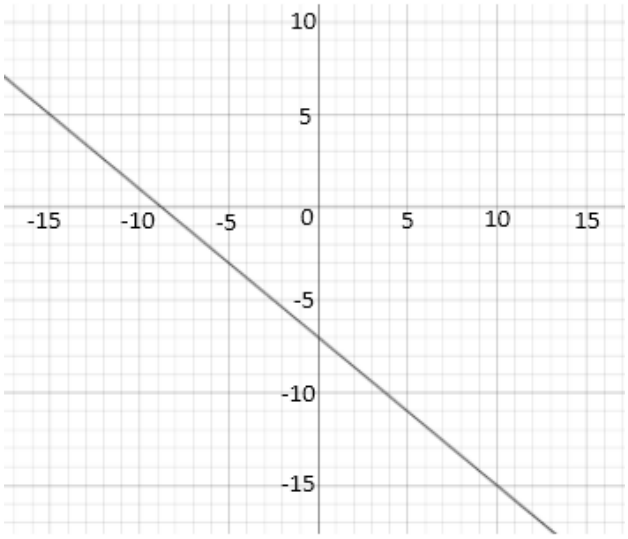
DO YOUR FIGURING HERE

3. Find the value(s) of x that satisfy the equation below. Show your work and write your solution(s) in the shaded box below.

$$3(x+5)^2 - 12 = 0$$

DO YOUR FIGURING HERE

4. The graph of a linear function $f(x) = -\frac{4}{5}x - 7$ is shown below. The graph of the function $g(x) = -15$ is not shown below.



For what value of x does $f(x) = g(x)$?

a. $x = -19$
b. $x = -10$
c. $x = 5$
d. $x = 10$

DO YOUR FIGURING HERE

5. If the point $(7, 6)$ lies on the graph of $y = (x - 5)^2 + k$, where k is some constant, which other point must also lie on the same graph?

   a. $(-5, 6)$
   b. $(3, 6)$
   c. $(5, 6)$
   d. $(9, 6)$

DO YOUR FIGURING HERE

6. A tennis ball is rolled off the edge of the roof of a building. Sean times how long it takes the ball to reach the ground and writes the function $h(t)$, that gives the height of the tennis ball in feet where t is the number of seconds since the ball cleared the edge of the roof.

$$h(t) = -16t^2 + 256$$

For parts a-c, show your work. Write your final answers in the shaded boxes.

a. How many feet above the ground is the ball after 2 seconds?
Show your work.

FINAL ANSWER

a.

b. How tall is the building at the edge of the roof?
Show your work.

FINAL ANSWER

b.

c. c. After how many seconds does the tennis ball hit the ground?
Show your work.

FINAL ANSWER

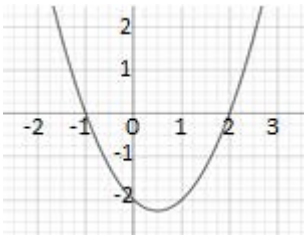
c.

DO YOUR FIGURING HERE

7. Suppose x and y are real numbers and $xy = 2$. Which of the following statements must be true about x and y?

   a. Both x and y must be rational.
   b. Both x and y must be irrational.
   c. Either x or y can be irrational but not both.
   d. If either x or y is irrational then the other must also be irrational.

8. Examine the two quadratic functions shown below.

1	2
$f(x) = x^2 - 2x - 3$	$g(x)$ 

Which statement is true about $f(x)$ and $g(x)$?

   a. $f(-1) > g(-1)$
   b. $f(0) = g(0)$
   c. $f(1) > g(1)$
   d. $f(2) < g(2)$

DO YOUR FIGURING HERE

9. Mariah makes a mistake in solving an equation. Her work is shown below:

$-5(x+4)^2 = -100$	step 1
$(x+4)^2 = 20$	step 2
$x^2 + 16 = 20$	step 3
$x^2 = 4$	step 4
$x = \pm 2$	step 5

Where did Mariah make a mathematical mistake?

a. Going from step 1 to step 2.
b. Going from step 2 to step 3.
c. Going from step 3 to step 4.
d. Going from step 4 to step 5.

10. Latanya buys a car. She receives a 10% discount and pays $27,000 after the discount. If x stands for the original price of the car, which equation would help you find x?

a. $0.10x = 27{,}000$
b. $\frac{x}{0.90} = 27{,}000$
c. $\frac{x}{1.10} = 27{,}000$
d. $0.90x = 27{,}000$

DO YOUR FIGURING HERE

11. Solve for x.

$$-\frac{1}{2}(x + 4) \geq 2x$$

a. $x \leq -\frac{4}{3}$

b. $x \geq -\frac{4}{3}$

c. $x \leq -\frac{4}{5}$

d. $x \geq -\frac{4}{5}$

12. The area, A, of a trapezoid with height h and bases b_1 and b_2 is given by the formula:

$$A = \frac{1}{2}(b_1 + b_2)h$$

Which of the following equations gives h for a trapezoid with an area of 32?

a. $h = \frac{16}{b_1+b_2}$

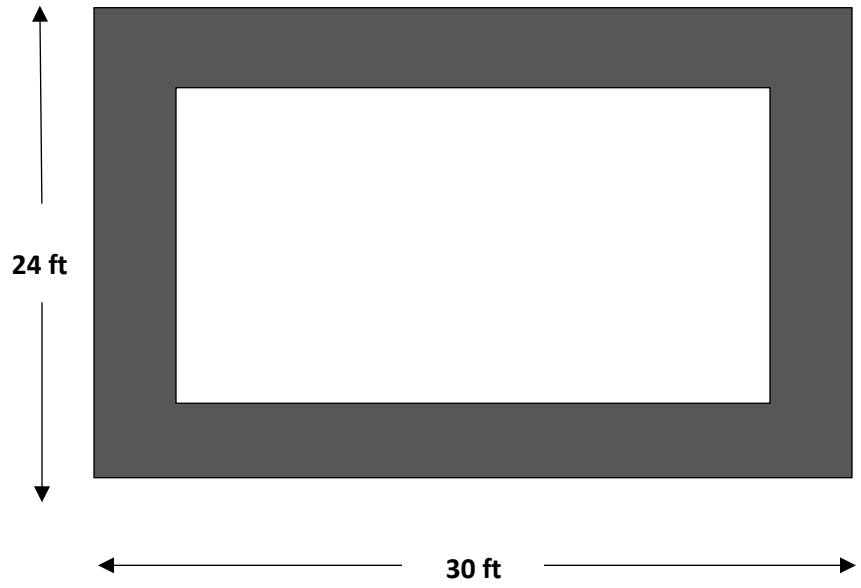
b. $h = \frac{64}{b_1+b_2}$

c. $h = \frac{16-b_1}{b_2}$

d. $h = \frac{64-b_1}{b_2}$

DO YOUR FIGURING HERE

13. A 30 foot by 24 foot carpet has a white center whose area is 432 square feet.



The carpet also has a dark grey border and the top, bottom, and side parts of this border have the same width, x.

a. Write an equation using the variable x that would allow you to find the width of the border.

b. Solve your equation to find the width of the border. Show your work. Include proper units in your answer. Write your final answer in the shaded box.

FINAL ANSWER

b.

DO YOUR FIGURING HERE

14. The table shows x and y values for a quadratic function. Based on the table, which of the following statements is true?

x	y
-4	-6
-3	-2
-2	1
-1	1
0	-2
1	-6

a. The graph of the function has 2 positive x–intercepts.

b. The graph of the function has 2 negative x–intercepts.

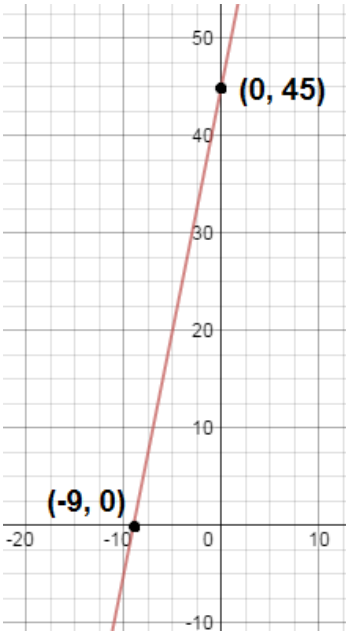
c. The graph of the function has 1 positive x–intercept and 1 negative x–intercept.

d. The graph of the function has no x–intercepts.

DO YOUR FIGURING HERE

15. On the left, a portion of the graph of a linear function $f(x)$ is shown in the xy plane. On the right, selected values of an exponential function $g(x)$ are shown in the table.

$$y = f(x)$$



x	$g(x)$
0	2
1	6
2	18

Given the graph and table, which statement below about $f(3)$ and $g(3)$ is true?

a. $f(3) > g(3)$
b. $f(3) < g(3)$
c. $f(3) = g(3)$

There is no way to determine a comparison between $f(3)$ and $g(3)$.

DO YOUR FIGURING HERE

16. The line $y = 3x - 6$ is graphed in the xy-plane. A second line with slope -1 passing through the point $(0, 2)$ is graphed in the same plane. If the two lines intersect at the point (a, b), what is the value of $a - b$?

a. -2
b. -1
c. 1
d. 2

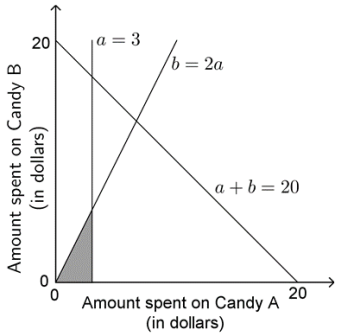
DO YOUR FIGURING HERE

17. Lydia is buying two types of candy for an upcoming party.

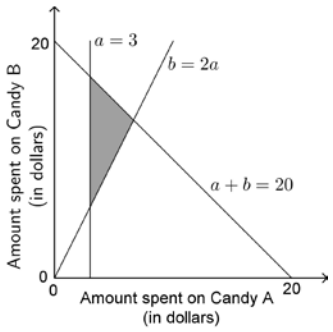
- She plans to spend no more than $20.00 in total.
- She wants to spend at least $3.00 on Candy A.
- She wants to spend at least twice as much on Candy B as she will on Candy A.

Which graph represents all possibilities for her purchase of Candy A and Candy B?

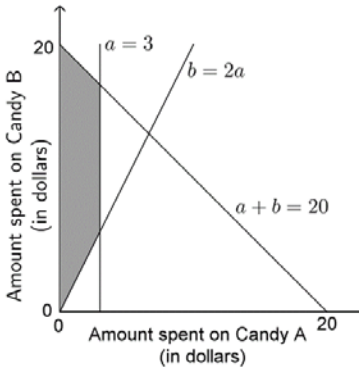
a.



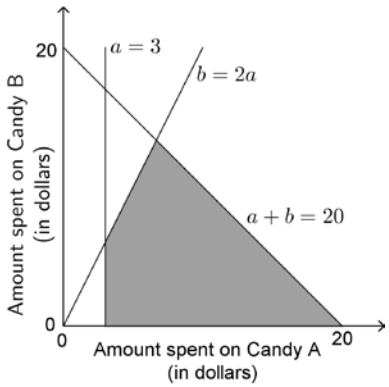
b.



c.



d.



DO YOUR FIGURING HERE

18.

$$kx - 3y = 7$$

$$4x - 2y = 9$$

In the system of equations above, k is a constant and x and y are variables. For what value of k will the system of equations have no solution?

a. -6

b. -2

c. 2

d. 6

DO YOUR FIGURING HERE

19. Use Parabolas #1 and #2 to answer parts a, b, and c.

a. For Parabola #1, identify the y-intercept(s).

Parabola #1

$$y = -\frac{1}{2}(x-3)^2 + 5$$

y-intercept(s): _____

b. For Parabola #2, identify the x-intercept(s).

Parabola #2

x	y
2	0
3	5
4	8
5	9
6	8

x-intercept(s): _____

c. Which Parabola (#1 or #2) has a higher maximum y-value? Explain how you know.

DO YOUR FIGURING HERE

20. Which function represented below has the greatest y-intercept?

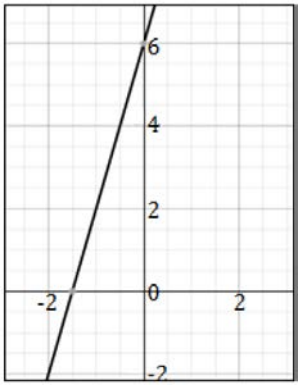
a. $f(x) = 3x$

b. $2x + 3y = 12$

c.

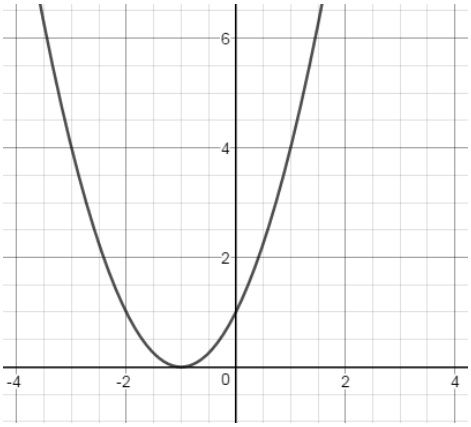
x	y
-3	-12
-1	-8
1	-4
3	0
5	4

d.



DO YOUR FIGURING HERE

21. Consider the function $f(x) = x^2$. The graph of a *transformation* of $f(x)$ is shown.



Which expression is represented by this graph?

a. $f(x) - 1$
b. $f(x) + 1$
c. $f(x - 1)$
d. $f(x + 1)$

Reference Sheet

1 inch = 2.54 centimeters
1 meter = 39.37 inches
1 mile = 5,280 feet
1 mile = 1,760 yards
1 mile = 1.609 kilometers

1 kilometer = 0.62 mile
1 pound = 16 ounces
1 pound = 0.454 kilograms
1 kilogram = 2.2 pounds
1 ton = 2,000 pounds

1 cup = 8 fluid ounces
1 pint = 2 cups
1 quart = 2 pints
1 gallon = 4 quarts
1 gallon = 3.785 liters
1 liter = 0.264 gallons
1 liter = 1000 cubic centimeters

Triangle	$A = \frac{1}{2}bh$
Parallelogram	$A = bh$
Circle	$A = \pi r^2$
Circle	$C = \pi d$ or $C = 2\pi r$
General Prisms	$V = Bh$

Cylinder	$V = \pi r^2 h$
Pyramid	$V = \frac{1}{3}Bh$
Sphere	$V = \frac{4}{3}\pi r^2$
Cone	$V = \frac{1}{3}\pi r^2 h$
Pythagorean Theorem	$a^2 + b^2 = c^2$
Quadratic Formula	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

SY14-15 Algebra Exit Exam: Word – for – Word Glossary: English/Spanish	
English	**Spanish**
account	cuenta
ants	hormigas
annual	anual
appropriate	apropiado
chicken	pollo
coefficient	coeficiente
decreases	disminuye
degrees	grados
deposits	depósitos
discount	descuento
domain	dominio
donate, donation	donar, donación
drawn to scale	dibujados a escala
equation	ecuación
expansion	expansión
factor	factor
formula	fórmula
function	función
garden	jardín
graph	gráfica
increases	aumenta
infinitely	indefinidamente
integer	número entero
interpretation	interpretación
intersects	cruzar, cruzarse
irrational	irracional
length	largo, longitud
line	línea
linear equation	ecuación lineal
linear function	función lineal
linear model	modelo lineal
maximum	máximo
miles	millas
minimum	mínimo
months	meses
motorcycle	motocicleta
ordered pair	par ordenado
parabola	parabola

SY14-15 Algebra Exit Exam: Word – for – Word Glossary: English/Spanish	
English	**Spanish**
parallel	paralelo
pasta	pasta
perimeter	perímetro
perpendicular	perpendicular
point	punto
positive	positivo
quadratic function	función cuadrática
rational	racional
real numbers	números reales
rectangle	rectángulo
recursive relationship	relación recursiva
reflected	reflejado
runner	corredor
seconds	segundos
shifted	movido, cambiado
slope	pendiente (sustantivo)
solution(s)	soluciones
species	especies
speed	velocidad
symmetry	simetría
system of equations	sistemas de ecuaciones
temperature	temperatura
transformation	transformación
upward	hacia arriba
value	valor
variables	variable
vegetarian	vegetariano
width	ancho
x – axis, y – axis	eje “x”, eje “y”
x – coordinate , y – coordinate	coordenada x, coordenada y
x – intercept, y – intercept	intersección x, intersección y
zeros	ceros