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Show your work on separate paper.

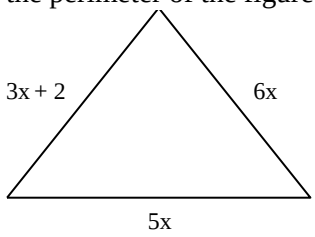
Algebra Review

Multiple Choice
Identify the choice that best completes the statement or answers the question.

____ 1. A student visiting the Sears Tower Skydeck is 1353 feet above the ground. Find the distance the student can see to the horizon. Use the formula $d = \sqrt{1.5h}$ to approximate the distance *d* in miles to the horizon when *h* is the height of the viewer's eyes above the ground in feet. Round to the nearest mile.

a. 45 miles b. 36 miles c. 1010 miles d. 601 miles

____ 2. Write the perimeter of the figure.



not to scale

a. $30x + 3x + 2$ b. $14x + 2$ c. $9x + 7x$ d. $14x$

Tell whether the lines for each pair of equations are *parallel*, *perpendicular*, or *neither*.

____ 3. $y = \frac{2}{3}x + 4$
$24x + 16y = -20$
a. parallel b. perpendicular c. neither

Solve the equation using square roots.

____ 4. $6x^2 = 54$
a. ± 3 c. no real number solutions
b. 3 d. ± 9

Factor the expressions below.

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____ 5. $6x^2 + 5x + 1$

a. $(3x - 1)(2x - 1)$
b. $(3x - 1)(2x + 1)$
c. $(3x + 1)(2x - 1)$
d. $(3x + 1)(2x + 1)$

____ 6. $r^2 - 49$

a. $(r + 7)(r + 7)$
b. $(r - 7)(r + 9)$
c. $(r - 7)(r - 7)$
d. $(r - 7)(r + 7)$

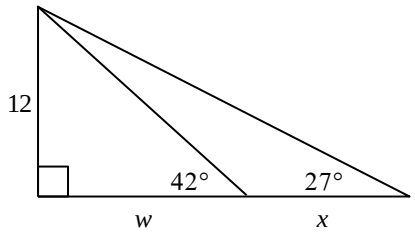
____ 7. $3x^3 + 3x^2 + x + 1$

a. $x(3x^2 + x + 1)$
b. $(x + 1)(3x^2 + 1)$
c. $(x + 3)(3x^2 - 1)$
d. $3x^2(x + 1)$

Find the product.

____ 8. $(5p - 3)(5p + 3)$
a. $25p^2 - 9$
b. $25p^2 + 30p + 9$
c. $25p^2 + 9$
d. $25p^2 - 30p - 9$

____ 9. Find the value of w, then x. Round lengths of segments to the nearest tenth.



a. $w = 10.8$, $x = 6.1$
b. $w = 10.8$, $x = 16.9$
c. $w = 13.3$, $x = 23.6$
d. $w = 13.3$, $x = 10.2$

Use the quadratic formula to solve the equation. If necessary, round to the nearest hundredth.

____ 10. $-6y^2 - 3y = -7$
a. –0.86, 1.36 b. –2.72, 1.72 c. –1.36, 0.86 d. –15, 14.5

Simplify the radical expression.

____ 11. $-3\sqrt{98a^5b^2}$

a. $7\sqrt{2a^5b^2}$
c. $-21a^2b\sqrt{2a}$

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b. $-21\sqrt{2a^5b^2}$ d. $-3ab\sqrt{49}$

____ 12. $\sqrt{\frac{80w^3}{9}}$

a. $\frac{4w\sqrt{5w}}{3}$ b. $\frac{\sqrt{80w^3}}{3}$ c. $\frac{w\sqrt{80w}}{3}$ d. $3\sqrt{w^3}$

____ 13. $-\sqrt{10d} \cdot \sqrt{15}$

a. $-\sqrt{150d}$ b. $\sqrt{150d}$ c. $-5\sqrt{6d}$ d. $-5\sqrt{6d^2}$

____ 14. Write the polynomial in standard form.

$9g - 7g^3 + 4g^2 - 1$

a. $7g^3 - 4g^2 + 9g - 1$ c. $4g^3 - 7g^2 + 9g - 1$
b. $-1 + 9g + 4g^2 - 7g^3$ d. $-7g^3 + 4g^2 + 9g - 1$

Solve the equation by factoring.

____ 15. $z^2 - 4z - 32 = 0$

a. $z = -4$ or $z = 8$ c. $z = -4$ or $z = -8$
b. $z = 4$ or $z = -8$ d. $z = 4$ or $z = 8$

____ 16. $c^2 - 7c = 0$

a. $c = 1$ or $c = -\sqrt{7}$ c. $c = 0$ or $c = -7$
b. $c = 0$ or $c = \sqrt{7}$ d. $c = 0$ or $c = 7$

____ 17. Find the equation of the axis of symmetry and the coordinates of the vertex of the graph of the function.

$y = x^2 - 2x - 1$

a. none of these are correct d. $x = 1$; vertex: $(1, -2)$
b. $x = \frac{5}{8}$; vertex: $\left(\frac{5}{8}, 3\frac{11}{16}\right)$ e. $x = 2$; vertex: $(2, -1)$
c. $x = -2$; vertex: $(-2, 7)$

Simplify the expression.

____ 18. $\frac{8}{\sqrt{6} - \sqrt{3}}$

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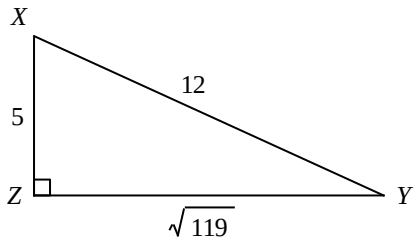
a. $\frac{8\left(\sqrt{6}+\sqrt{3}\right)}{9}$

b. $\frac{8\sqrt{6}-8\sqrt{3}}{3}$

c. $\frac{8\sqrt{6}+8\sqrt{3}}{3}$

d. $\frac{8\sqrt{6}+8\sqrt{3}}{\sqrt{27}}$

____ 19. Write the ratios for sin *X* and cos *X*.



a. $\sin X = \frac{5}{\sqrt{119}}, \cos X = \frac{\sqrt{119}}{5}$

b. $\sin X = \frac{\sqrt{119}}{12}, \cos X = \frac{5}{12}$

c. $\sin X = \sqrt{119}, \cos X = 5$

d. $\sin X = \frac{\sqrt{119}}{5}, \cos X = \frac{5}{\sqrt{119}}$

____ 20. Evaluate the expression for the given value of x.

$-x^{-2}$ x=5

a. -10

b. 10

c. $-\frac{1}{25}$

d. $\frac{1}{10}$

e. $\frac{1}{25}$

Graph the inequality.

____ 21. $3x - 7y < -21$

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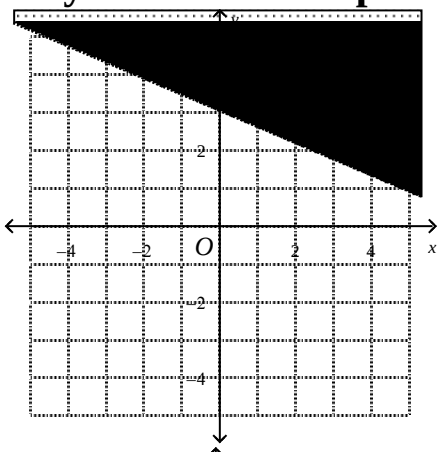
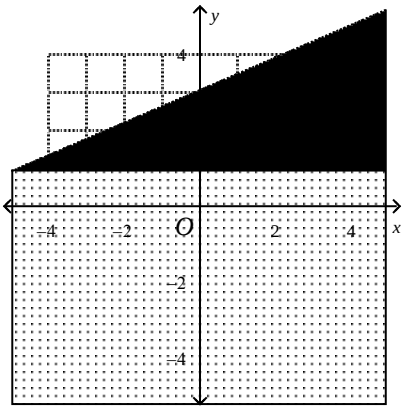
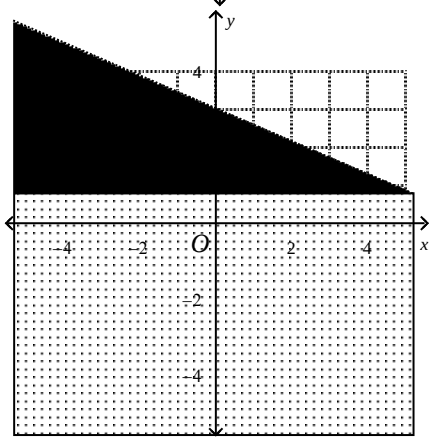
a.



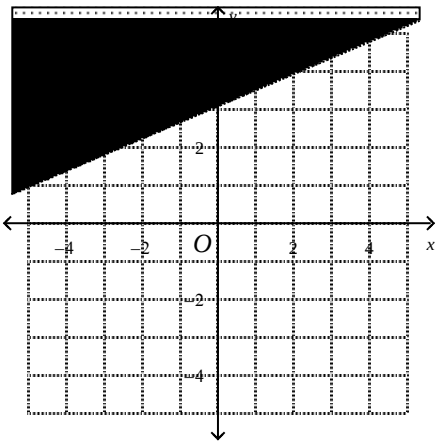
c.



b.



d.



____ 22. The velocity of sound in air is given by the equation $v = 20\sqrt{273 + t}$ where *v* is the velocity in meters per second and *t* is the temperature in degrees Celsius. Find the temperature when the velocity of sound in air is 373 meters per second. Round to the nearest degree.

a. 75º b. 6,683º c. 508º d. 7,229º

Add or subtract.

____ 23. $\frac{2x + 3}{x} - \frac{x - 5}{x + 2}$

a. $\frac{x^2 + 12x + 6}{x(x + 2)}$

b. $\frac{x^2 - 2x - 2}{x(x + 2)}$

d. $\frac{x + 8}{x(x + 2)}$

e. none of the answers are correct

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c. $\dfrac{3x - 2}{2x + 2}$

Multiply to simplify the product.

____ 24. $(2x - 6)^2$

a. $4x^2 - 24x + 36$
b. $4x^2 - 8x + 36$
c. $4x^2 + 36$
d. $4x^2 - 12x + 36$

Factor to simplify the rational expression.

____ 25. $\dfrac{5x - 10}{5x + 30}$

a. $\dfrac{x + 6}{x - 2}$
b. $\dfrac{x - 2}{5x + 30}$
c. $5\left(\dfrac{x + 2}{x - 6}\right)$
d. $\dfrac{x - 2}{x + 6}$

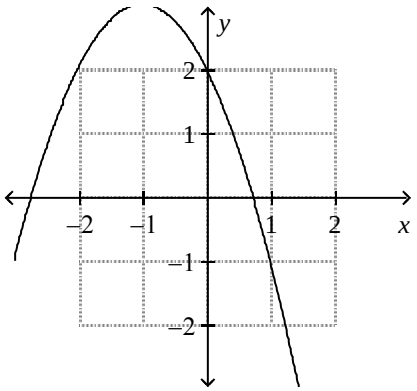
____ 26. $\dfrac{x^2 - 11x + 30}{x^2 - x - 30}$

a. $\dfrac{x + 5}{x - 5}$
b. $\dfrac{x - 6}{x - 5}$
c. $\dfrac{x - 5}{x + 5}$
d. $\dfrac{x - 5}{x - 6}$

____ 27. A grid shows the positions of a subway stop and your house. The subway stop is located at (–9, –4) and your house is located at (1, –5). What is the distance, to the nearest unit, between your house and the subway stop?

a. 7
b. 15
c. 10
d. 20

____ 28. Identify the vertex of the graph. Tell whether it is a minimum or maximum.



a. (–1, 3); minimum
b. (–1, 3); maximum
c. (3, –1); minimum
d. (3, –1); maximum

Solve the equation.

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____ 29. $-9 = \sqrt{x} - 9$

a. 1 b. 81 c. $\sqrt{2}$ d. 0

____ 30. $\frac{3}{5x} - \frac{6}{x} = -3$

a. $x = 9$ b. $x = \frac{9}{5}$ c. $x = -27$ d. $x = -\frac{11}{5}$

Find and simplify the product using FOIL.

____ 31. $(3x - 7)(3x - 5)$

a. $9x^2 + 36x + 35$
b. $9x^2 + 6x + 35$
c. $9x^2 - 36x - 35$
d. $9x^2 - 36x + 35$

____ 32. The formula $v = \sqrt{64h}$ can be used to find the velocity v in feet per second of an object that has fallen h feet. Find the velocity of an object that has fallen 32 feet. Round your answer to the nearest hundredth.

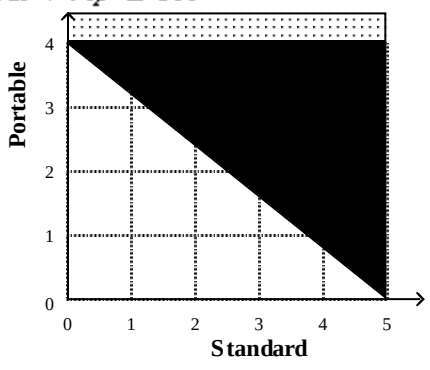
a. 362.04 feet per second
b. 1,024 feet per second
c. 256 feet per second
d. 45.25 feet per second

____ 33. An electronics store makes a profit of $72 for every standard CD player sold and $90 for every portable CD player sold. The manager's target is to make at least $360 a day on sales from standard and portable CD players.

a. Write an inequality that represents the numbers of both kinds of CD players that can be sold to reach or exceed the sales target. Let s represent the number of standard CD players and p represent the number of portable CD players.

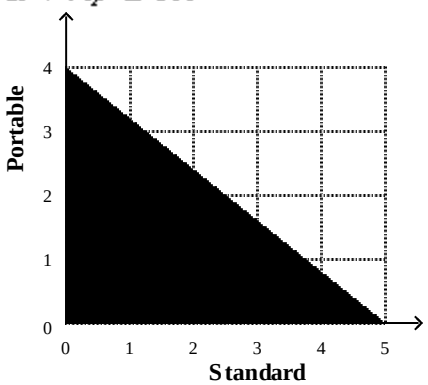
b. Graph the inequality.

a. $72s + 90p \geq 360$



b. $90s + 72p \geq 360$

c. $72s + 90p \leq 360$



d. $90s + 72p \leq 360$

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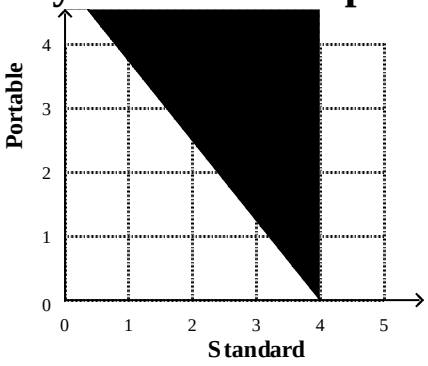

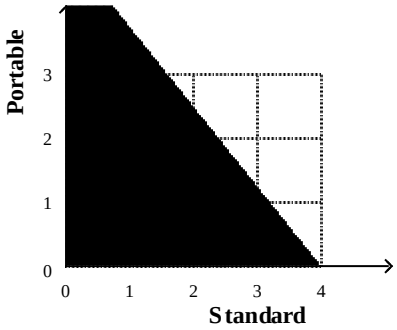

Factor, Multiply, and Simplify.

____ 34. $\frac{x^2 - 16}{6x} \cdot \frac{7x}{x + 4}$

a. $\frac{7(x + 4)}{6}$

b. $\frac{7(x - 4)}{6}$

c. $\frac{(x + 4)^2(x - 4)}{42x^2}$

d. $\frac{(x - 4)^2(x + 4)}{42x^2}$

Divide.

____ 35. Divide using long division.

$(6x^2 - 13x + 2) \div (3x - 2)$

a. $2x - 3$

b. $2x - 3 - \frac{4}{3x - 2}$

c. $2x - 3 - \frac{6}{3x - 2}$

d. $2x - 7$

____ 36. Factor, divide, and simplify.

$\frac{s^2 - 2s}{s^2 + s - 6} \div \frac{s + 6}{s + 3}$

a. $\frac{s}{s + 6}$ b. $\frac{s + 6}{s}$ c. $\frac{s - 2}{s + 6}$ d. $\frac{s - 2}{s^2 + 6s}$

____ 37. Rationalize the denominator. Then simplify your answer.

$\frac{11}{\sqrt{6}}$

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a. $\frac{\sqrt{66}}{6}$

b. $\frac{121}{6}$

c. $\frac{11\sqrt{6}}{6}$

d. $\frac{\sqrt{17}}{6}$

Solve the equation using the zero-product property.

____ 38. $-4n(7n - 8) = 0$

a. $n = 0$ or $n = -\frac{8}{7}$

b. $n = 0$ or $n = \frac{8}{7}$

c. $n = -\frac{1}{4}$ or $n = \frac{8}{7}$

d. $n = -\frac{1}{4}$ or $n = -\frac{8}{7}$

Multiply.

____ 39. $8p(-3p^2 + 6p - 2)$

a. $48p^2 - 16p - 24p^3$

b. $14p^2 - 6p - 5p^3$

c. $-24p^3 + 48p^2 - 16p$

d. $-5p^3 + 14p^2 - 6p$

Use any method to solve the equation. If necessary, round to the nearest hundredth.

____ 40. $8x^2 = 14$

a. 3.74, –3.74 b. 0.76, –0.76 c. 2.83, –2.83 d. 1.32, –1.32

____ 41. Find the distance between the points. Round to the nearest hundredth.
(-5, -1) and (9, -3)

a. 12.65
b. 14.14
c. 14.56
d. 4.47
e. 5.66

Find the slope of the line.

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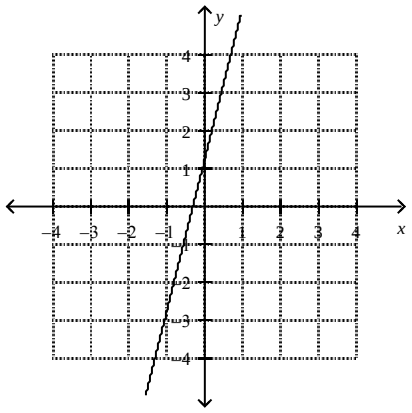
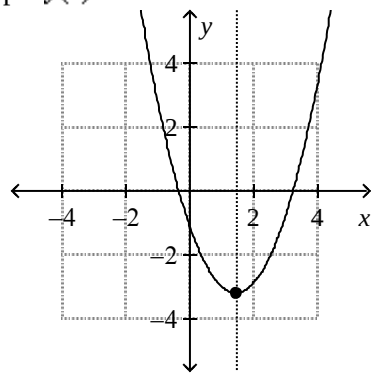
____ 42.



a. -4 b. 4 c. $-\frac{1}{4}$ d. $\frac{1}{4}$

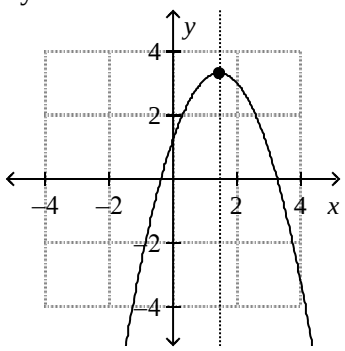
____ 43. Graph $f(x) = -x^2 + 3x + 1$. Label the axis of symmetry and vertex.

a.



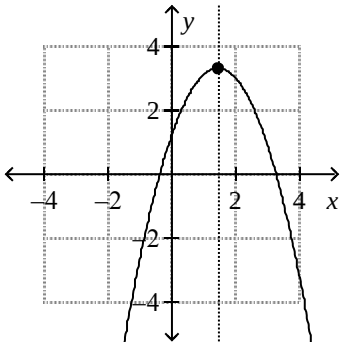
Axis of symmetry: $x = 1.5$
Vertex: $(1.5, -3.25)$

c.



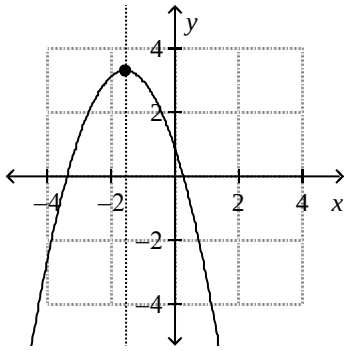
Axis of symmetry: $x = 1.5$
Vertex: $(1.5, 3.25)$

b.



Axis of symmetry: $x = 1.5$

d.



Axis of symmetry: $x = -1.5$

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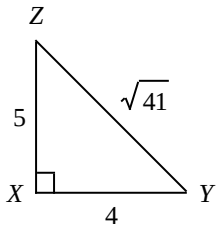
Vertex: $(1.5, -3.25)$ Vertex: $(-1.5, 3.25)$

____ 44. Write the tangent ratios for $\angle Y$ and $\angle Z$.



Not drawn to scale

a. $\tan Y = \frac{4}{5}; \tan Z = \frac{5}{4}$

b. $\tan Y = \frac{5}{\sqrt{41}}; \tan Z = \frac{4}{\sqrt{41}}$

c. $\tan Y = \frac{5}{4}; \tan Z = \frac{4}{5}$

d. $\tan Y = \frac{\sqrt{41}}{5}; \tan Z = \frac{\sqrt{41}}{4}$

Simplify the difference.

____ 45. $(2w^2 - 5w - 8) - (4w^2 + 3w - 3)$

a. $6w^2 + 8w + 5$

b. $6w^2 - 2w - 11$

c. $-2w^2 - 8w - 5$

d. $-2w^2 - 2w - 11$

____ 46. Perform the division and simplify.

$$\frac{2u^2 - 8}{4u^2 - 45u + 81} \div \frac{u + 2}{4u^2 - 41u + 72}$$

a. $\frac{2(u-2)(u-8)}{u+9}$

b. $\frac{2(u-2)(u+8)}{u-9}$

c. $\frac{2(u-2)(u-8)}{u-9}$

d. $\frac{2(u+2)(u-8)}{u-9}$

e. $\frac{2(u-2)(u-8)}{u+9}$

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

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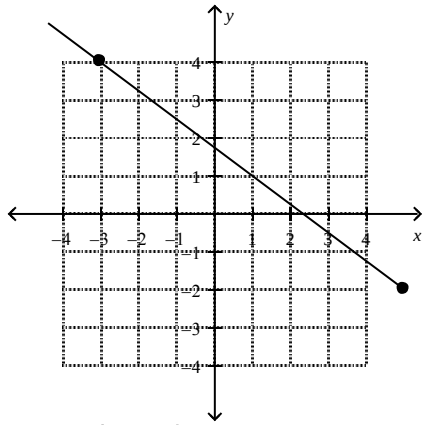
____ 47.



a. $y = -\frac{4}{3}x + \frac{7}{4}$

b. $y = \frac{3}{4}x + \frac{7}{4}$

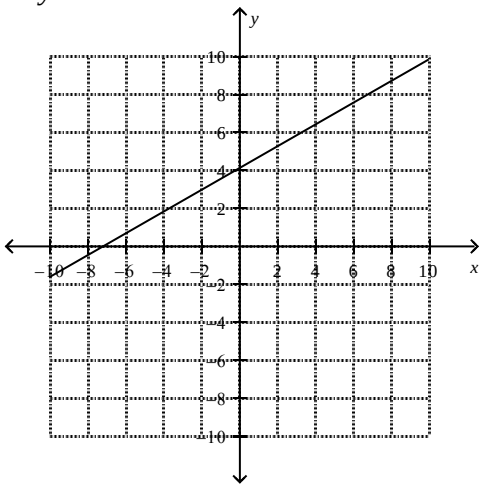
c. $y = -\frac{3}{4}x + \frac{7}{4}$

d. $y = \frac{7}{4}x + \frac{3}{4}$

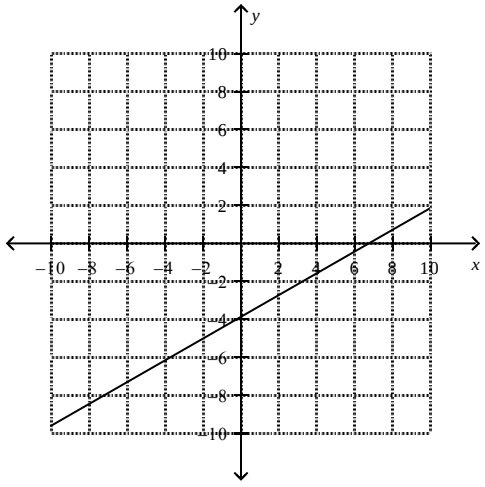
Match the equation with its graph.

____ 48. $-4x - 7y = 28$

a.



c.



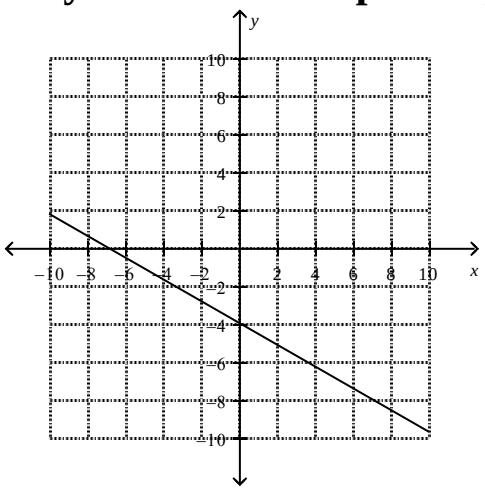
Name: _____ Class: _____

H. Algebra 2/Trig. Summer Work.

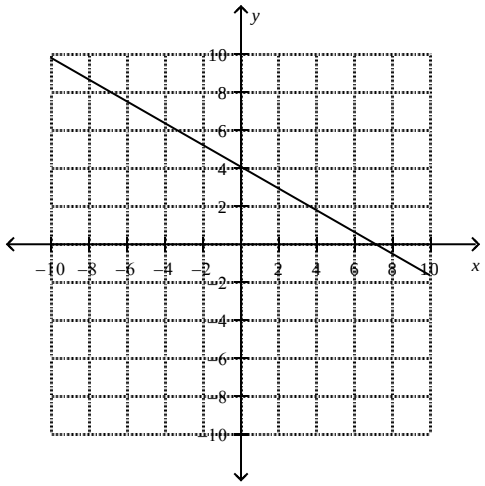
Your goal should be to understand the concepts behind the questions, not just to obtain the correct answer. Look up what you don't remember. I am expecting you to know how to do these types of problems before you start this class.
Use mathisfun.com or khan academy as resources.

Show your work on separate paper.

b.



d.

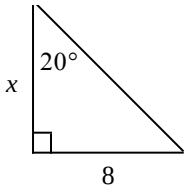


____ 49. Find the midpoint of the line segment joining the points.
(2, 2) and (8,6)

a. (-3, -2)
b. (-5, -4)
c. (4, 5)
d. (5, 4)

Use a trigonometric ratio to find the value of *x*. Round your answer to the nearest tenth.

____ 50.



Not drawn to scale

a. 2.9
b. 2.7
c. 7.5
d. 22