Name: _____ _____

H. Algebra 2/Trig. Summer Work.

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Show your work on separate paper.

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

Solve the equation.

____ 1. $-3 = \sqrt{r} - 3$

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

____ 2. $\frac{1}{3x} - \frac{5}{x} = -5$

a. $x = -1$ b. $x = \frac{14}{15}$ c. $x = \frac{14}{5}$ d. $x = -14$

Add or subtract.

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

a. $\frac{x^2 + 12x + 6}{x(x + 2)}$
b. $\frac{x + 8}{x(x + 2)}$
c. $\frac{x^2 - 2x - 2}{x(x + 2)}$
d. $\frac{3x - 2}{2x + 2}$
e. none of the answers are correct

Factor the expressions below.

____ 4. $r^2 - 49$

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

____ 5. $3x^3 + 3x^2 + x + 1$

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

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

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

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Factor to simplify the rational expression.

____ 7. $\frac{2x - 2}{2x + 14}$

a. $\frac{x + 7}{x - 1}$ b. $\frac{x - 1}{2x + 14}$ c. $2\left(\frac{x + 1}{x - 7}\right)$ d. $\frac{x - 1}{x + 7}$

____ 8. $\frac{x^2 - 2x - 8}{x^2 + 6x + 8}$

a. $\frac{x + 4}{x - 4}$ b. $\frac{x - 4}{x + 2}$ c. $\frac{x + 2}{x - 4}$ d. $\frac{x - 4}{x + 4}$

____ 9. 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 40 feet. Round your answer to the nearest hundredth.

a. 404.77 feet per second
b. 50.6 feet per second
c. 320 feet per second
d. 1,280 feet per second

____ 10. A grid shows the positions of a subway stop and your house. The subway stop is located at (0, 7) and your house is located at (6, 4). Plot the points and calculate the distance, to the nearest unit, between your house and the subway stop?

a. 4 b. 17 c. 12 d. 7

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

____ 11. $3y^2 + 3y = 1$

a. 3, –4 b. 0.53, –2.53 c. 0.26, –1.26 d. 1.26, –0.26

Solve the equation using square roots.

____ 12. $2x^2 = 242$

a. ± 121
b. 11
c. no real number solutions
d. ± 11

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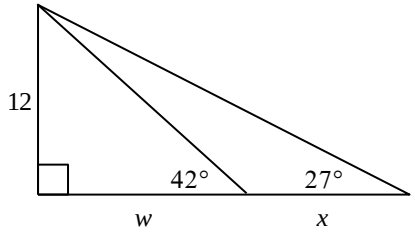
____ 13. Use trigonometry to find the value of *w*, then *x*. Round lengths of segments to the nearest tenth.

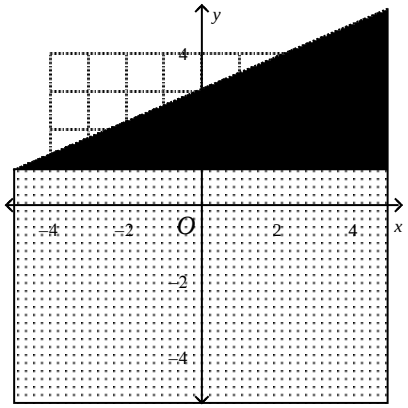


a. $w = 10.8$, $x = 16.9$
b. $w = 13.3$, $x = 23.6$
c. $w = 10.8$, $x = 6.1$
d. $w = 13.3$, $x = 10.2$

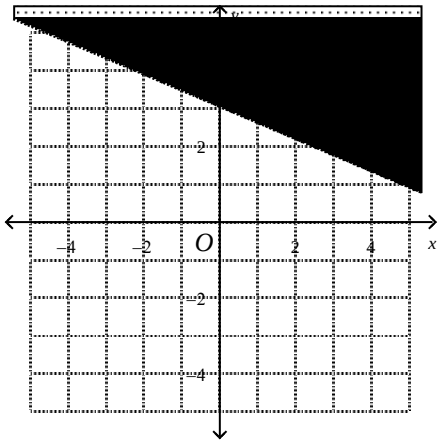
Graph the inequality.

____ 14. $3x - 7y < -21$

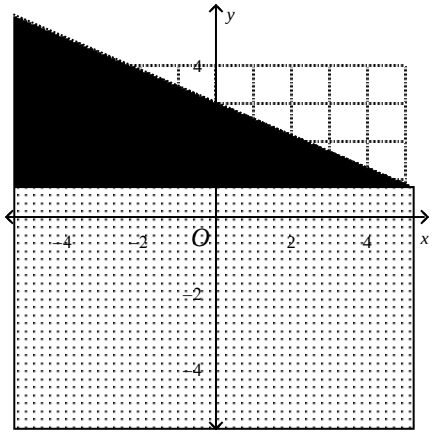
a.



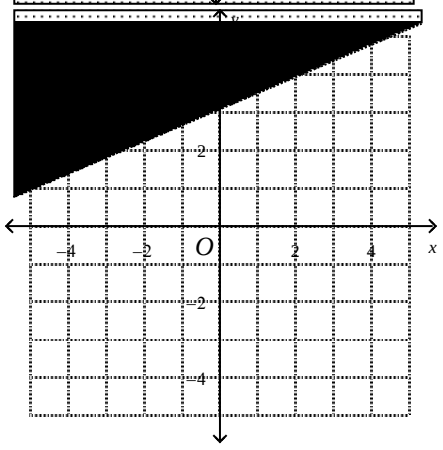
b.



c.



d.



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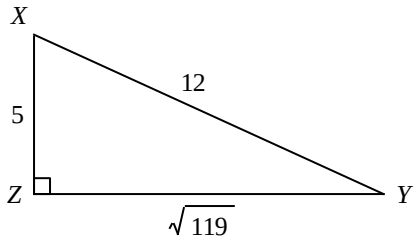
____ 15. Write the ratios for sin *X* and cos *X*.



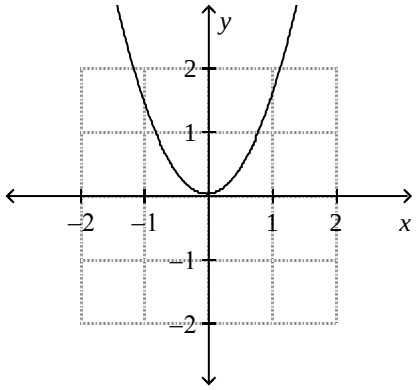
a. $\sin X = \frac{\sqrt{119}}{5}, \cos X = \frac{5}{\sqrt{119}}$

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

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

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

____ 16. Identify the vertex of the graph. Tell whether it is a minimum or maximum.



a. (0, 1); minimum

b. (0, 0); minimum

c. (0, 0); maximum

d. (0, 1); maximum

Multiply.

____ 17. $8p(-3p^2 + 6p - 2)$

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

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

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

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

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Simplify the radical expression.

____ 18. $-\sqrt{10y^3} \cdot 2\sqrt{4y^2}$

a. $-4\sqrt{10y^5}$ b. $\sqrt{40y^5}$ c. $-4y^2\sqrt{10y}$ d. $-2\sqrt{40y^5}$

____ 19. $2\sqrt{75a^2}$

a. $2a\sqrt{37.5}$
b. $5\sqrt{3a^2}$
c. $10a\sqrt{3}$
d. $10\sqrt{3a^2}$

____ 20. $\sqrt{\frac{80w^3}{9}}$

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

____ 21. 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 363 meters per second. Round to the nearest degree.

a. 504º b. 56º c. 6,315º d. 6,861º

Factor, Multiply, and Simplify.

____ 22. $\frac{x^2 - 16}{6x} \cdot \frac{7x}{x + 4}$

a. $\frac{7(x - 4)}{6}$
b. $\frac{7(x + 4)}{6}$
c. $\frac{(x - 4)^2(x + 4)}{42x^2}$
d. $\frac{(x + 4)^2(x - 4)}{42x^2}$

____ 23. Find the midpoint of the line segment joining the points.
(2, 2) and (8,6)

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

Name: _____ _____

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Show your work on separate paper.

____ 24. 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. $x = \frac{5}{8}$; vertex: $\left(\frac{5}{8}, 3\frac{11}{16}\right)$

b. none of these are correct

c. $x = -2$; vertex: $(-2, 7)$

d. $x = 2$; vertex: $(2, -1)$

e. $x = 1$; vertex: $(1, -2)$

Divide.

____ 25. Factor, divide, and simplify.

$$\frac{s^2 - 4s}{s^2 + s - 20} \div \frac{s + 4}{s + 5}$$

a. $\frac{s - 4}{s^2 + 4s}$ b. $\frac{s - 4}{s + 4}$ c. $\frac{s + 4}{s}$ d. $\frac{s}{s + 4}$

____ 26. Rationalize the denominator. Then simplify your answer.

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

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

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

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

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

____ 27. Write the polynomial in standard form.

$4g - 10g^3 + g^2 - 6$

a. $10g^3 - g^2 + 4g - 6$

b. $g^3 - 10g^2 + 4g - 6$

c. $-10g^3 + g^2 + 4g - 6$

d. $-6 + 4g + g^2 - 10g^3$

Name: _____ _____

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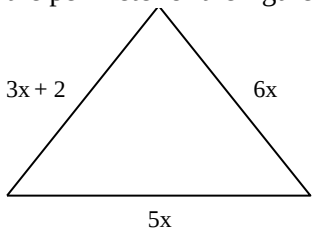
Show your work on separate paper.

____ 28. Write the perimeter of the figure.



not to scale

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

Find and simplify the product using FOIL.

____ 29. $(3x - 7)(3x - 5)$

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

Solve the equation by factoring.

____ 30. $c^2 - 1c = 0$

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

____ 31. $z^2 + 2z - 3 = 0$

a. $z = -1$ or $z = 3$
b. $z = 1$ or $z = 3$
c. $z = 1$ or $z = -3$
d. $z = -1$ or $z = -3$

Name: _____ _____

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____ 32. Evaluate the expression for the given value of x.

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

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

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

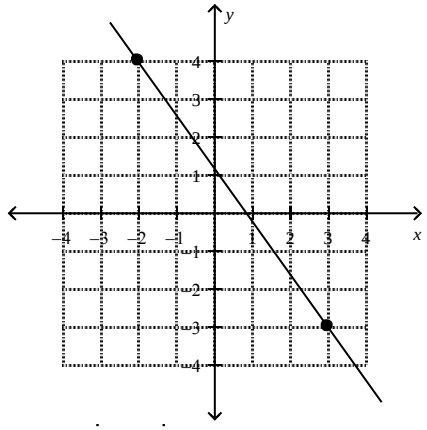
c. $-\frac{1}{25}$

d. 10

e. -10

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

____ 33.



a. $y = \frac{6}{5}x + \frac{7}{5}$

b. $y = -\frac{7}{5}x + \frac{6}{5}$

c. $y = -\frac{5}{7}x + \frac{6}{5}$

d. $y = \frac{7}{5}x + \frac{6}{5}$

Name: _____ _____

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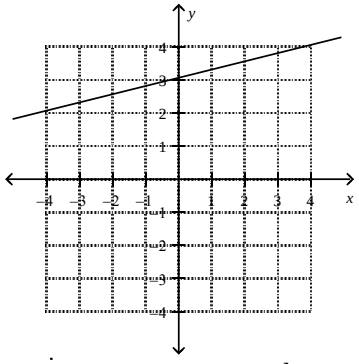
Show your work on separate paper.

Find the slope of the line.

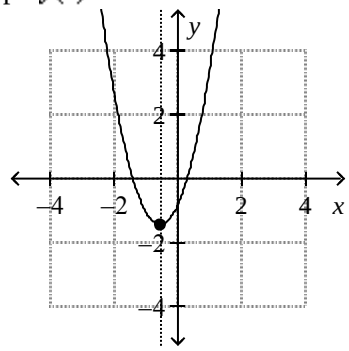
____ 34.



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

____ 35. Graph $f(x) = 2x^2 + 2x - 1$. Label the axis of symmetry and vertex. (b and d are on the next page)

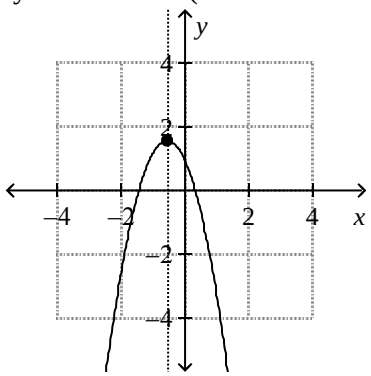
a.



Axis of symmetry: $x = -0.5$

Vertex: $(-0.5, -1.5)$

c.



Axis of symmetry: $x = -0.5$

Vertex: $(-0.5, 1.5)$

Name: _____ _____

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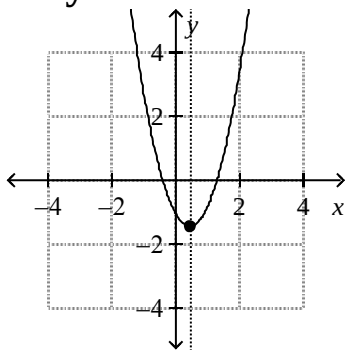
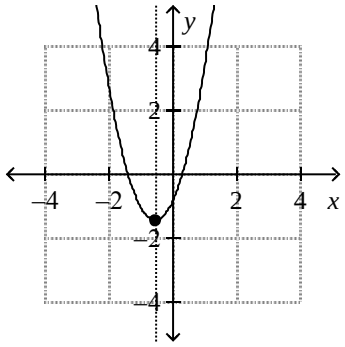
b.



Axis of symmetry: $x = 0.5$
Vertex: $(0.5, -1.5)$

d.



Axis of symmetry: $x = -0.5$
Vertex: $(-0.5, 1.5)$

____ 36. 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. $\frac{2(u-2)(u+8)}{u-9}$

____ 37. Find the distance between the points. Round to the nearest hundredth.
(-5, -1) and (9, -3)

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

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

____ 38. $y = -\frac{3}{2}x - 1$
$16x - 24y = -16$

a. parallel b. neither c. perpendicular

Name: _____ _____

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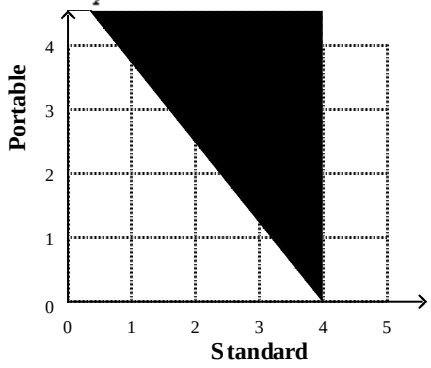
____ 39. An electronics store makes a profit of $72 for every standard CD player sold and $90 for every portable CD player sold. The manager's target is to make at least $360 a day on sales from standard and portable CD players.

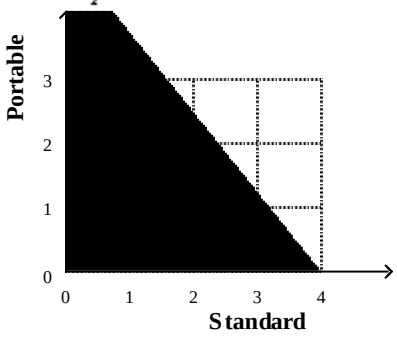
a. Write an inequality that represents the numbers of both kinds of CD players that can be sold to reach or exceed the sales target. Let *s* represent the number of standard CD players and *p* represent the number of portable CD players.

b. Graph the inequality.

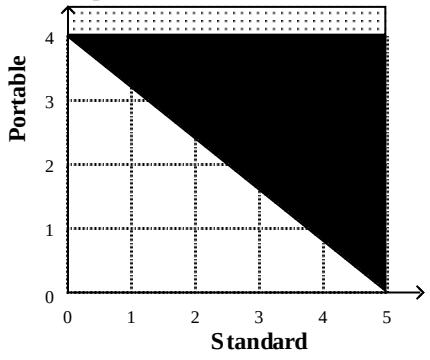
a. $90s + 72p \geq 360$



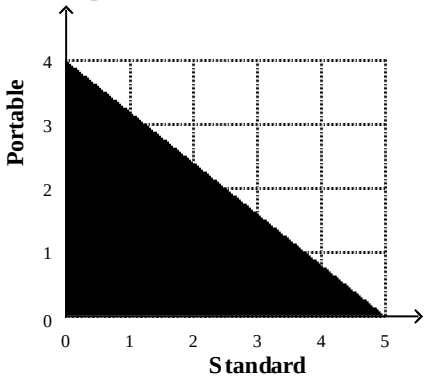
c. $90s + 72p \leq 360$



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



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



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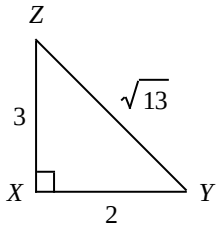
____ 40. Write the tangent ratios for $\angle Y$ and $\angle Z$.



Not drawn to scale

a. $\tan Y = \frac{3}{\sqrt{13}}; \tan Z = \frac{2}{\sqrt{13}}$

b. $\tan Y = \frac{\sqrt{13}}{3}; \tan Z = \frac{\sqrt{13}}{2}$

c. $\tan Y = \frac{2}{3}; \tan Z = \frac{3}{2}$

d. $\tan Y = \frac{3}{2}; \tan Z = \frac{2}{3}$

____ 41. 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. 1010 miles b. 601 miles c. 45 miles d. 36 miles

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

____ 42. $x^2 = 3$

a. 1, –1 b. 0.58, –0.58 c. 1.73, –1.73 d. 2.93, –3.13

Multiply to simplify the product.

____ 43. $(2x - 6)^2$

a. $4x^2 - 8x + 36$

b. $4x^2 - 12x + 36$

c. $4x^2 - 24x + 36$

d. $4x^2 + 36$

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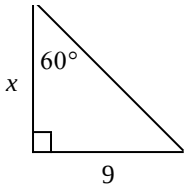
Show your work on separate paper.

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

____ 44.



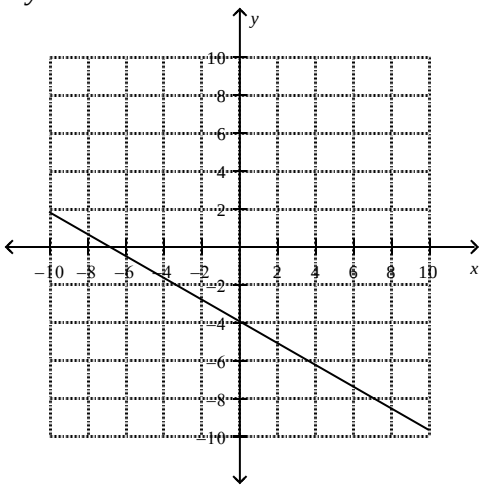
Not drawn to scale

a. 5.2 b. 15.6 c. 7.8 d. 4.5

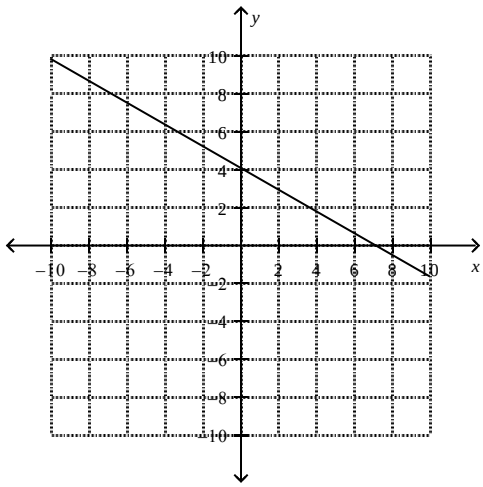
Match the equation with its graph. (b and d are on next page)

____ 45. $4x + 7y = 28$

a.



c.



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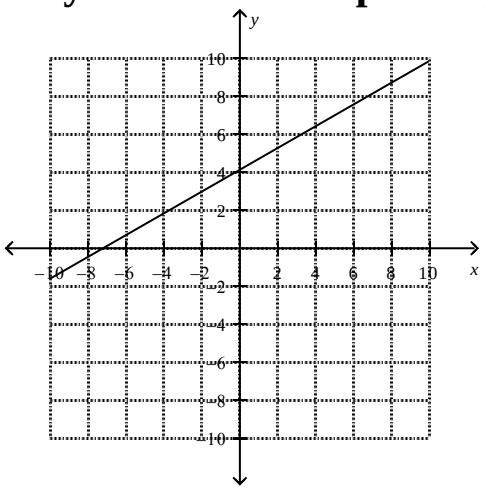
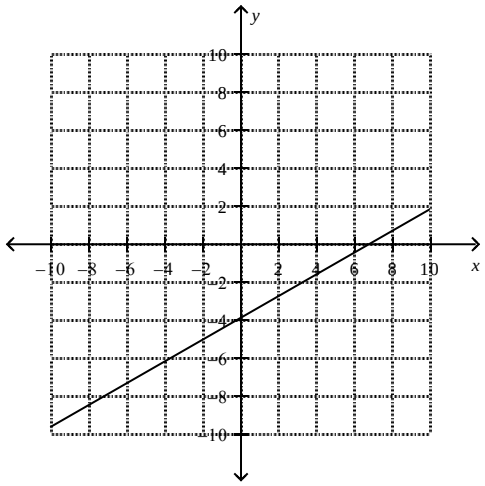
b.



d.



Solve the equation using the zero-product property.

____ 46. $n(3n + 1) = 0$

a. $n = 0$ or $n = -\frac{1}{3}$

b. $n = 1$ or $n = -\frac{1}{3}$

c. $n = 1$ or $n = \frac{1}{3}$

d. $n = 0$ or $n = \frac{1}{3}$

Find the product.

____ 47. $(7p - 4)(7p + 4)$

a. $49p^2 - 56p - 16$

b. $49p^2 + 16$

c. $49p^2 - 16$

d. $49p^2 + 56p + 16$

Simplify the difference.

____ 48. $(2w^2 - 8w - 3) - (7w^2 + 4w - 2)$

a. $9w^2 - 4w - 5$

b. $9w^2 + 12w + 1$

c. $-5w^2 - 12w - 1$

d. $-5w^2 - 4w - 5$

Name: _____ _____

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.

Simplify the expression.

____ 49. $\frac{8}{\sqrt{6}-\sqrt{3}}$

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

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

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

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

____ 50. The rate of discount, *R*, can be determined using the formula $R = 1 - \frac{P-D}{P}$, where *P* is the regular price of an item and *D* is the discount, or amount saved off the regular price. Find the rate of discount on a sweater with a regular price of $37 that is on sale for $25. If necessary, round to the nearest hundredth.

a. 1.32 b. 1.68 c. 0.68 d. 0.32