

32. Find the product $-2w^4(-4w^3 + 5w^2 + 2w + 12)$.

$$8w^4 - 10w^3 - 4w^2 - 24w$$

33. Find the product $(a+6)(-8a-7)$

$$\begin{aligned} &-8a^2 - 7a - 48a - 42 \\ &-8a^2 - 55a - 42 \end{aligned}$$

6	$-48a$	-42
a	$-8a^2$	$-7a$
	$-8a^2$	$-7a$

34. Find the product $(4x+9)^2$

$$16x^2 + 72x + 81$$

9	$36x$	81
4x	$16x^2$	$36x$
	$4x$	9

35. Write an expression to represent the area of the rectangle and simplify the expression.

Rectangle

$$4y - 7$$



$$4y + 7$$

$$(4y-7)(4y+7)$$

$$16y^2 - 49$$

7	
4y	
	$4y - 7$

36. Factor $f(x) = x^2 - 9x - 36$ and write the factors as a function of x .

$$f(x) = (x-12)(x+3)$$

	-36
x^2	

$$\begin{array}{r} -36x^2 \\ -9x \end{array}$$

37. Factor $f(x) = 8x^2 - 6x - 9$ and write the factors as a function of x .

$$f(x) = (4x+3)(2x-3)$$

-3	$-12x$	-9
2x	$8x^2$	$6x$
	$4x+3$	

$$\begin{array}{r} -72x \\ -12 \\ -6x \end{array}$$

38. Which of the following is the complete factorization of $20z^2 + 5z - 15$

$$5(4z^2 + z - 3)$$

1	$4z$	-3
x	$4z^2$	$-3z$
	$4z$	-3

$$5(4z-3)(z+1)$$

Practice Final Exam

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$$\begin{array}{r} -12z^2 \\ 4z \\ -3z \end{array}$$

39. Which of the following is the complete factorization of $8x^2 - 3x - 8x + 3$

$$(8x-3)(x-1)$$

$$8x^2 - 11x + 3$$

$$\begin{array}{|c|c|} \hline & 3 \\ \hline 8x^2 & \\ \hline \end{array}$$

$$\begin{array}{r} 24x^2 \\ -8x \quad -8x \\ \hline -11x \end{array}$$

40. Which of the following is the complete factorization of $x^3 + 343$

$$(x+7)^3$$

$$(x+7)(x^2 - 7x + 49)$$

41. Which two consecutive integers does $\sqrt{153}$ fall between?

$$\sqrt{144} = 12$$

$$\sqrt{169} = 13$$

42. What is the standard form of a quadratic equation?

$$ax^2 + bx + c$$

43. Sara drops a ball from the top of a bridge into a lake. The bridge is 40 feet above the water. She releases the ball and watches as it hits the water. **How long will it take for the ball to hit the water?**

Use the falling object model $h = -16t^2 + s$, where h is measured in feet and represents the ending height of the object, t is the number of seconds the object has fallen, and s is the initial height from which the object is dropped.

$$h = -16t^2 + 40$$

$$h = 0$$

$$0 = -16t^2 + 40$$

$$-40 = -16t^2$$

$$\frac{-40}{-16} = \frac{-16t^2}{-16}$$

$$t = \pm \sqrt{2.5}$$

$$t = +1.58 \text{ sec.}$$

44. Solve the following equation $x^2 = 121$.

$$x = \pm \sqrt{121}$$

$$x = \pm 11$$

$$2.5 = t^2$$

45. Solve the following equation $2x^2 - 5 = 27$.

$$\frac{2x^2}{2} = \frac{32}{2}$$

$$x^2 = 16$$

$$x = \sqrt{16}$$

$$x = \pm 4$$

46. Which is the simplest form of $\sqrt{126}$? $= \sqrt{9 \cdot 14} = \sqrt{9} \cdot \sqrt{14}$

$$3\sqrt{14}$$

47. Simplify the expression $-2\sqrt{8} \cdot \sqrt{24}$.

$$= -2\sqrt{4 \cdot 2} \cdot \sqrt{4 \cdot 6}$$

$$= -2 \cdot 2\sqrt{2} \cdot 2\sqrt{6}$$

$$= -8\sqrt{4 \cdot 2}$$

$$= -8(2) \cdot \sqrt{2}$$

$$= -4\sqrt{2} \cdot 2\sqrt{6}$$

$$= -8\sqrt{12}$$

$$= -16\sqrt{2}$$

48. Simplify the expression $\sqrt{\frac{144}{49}}$

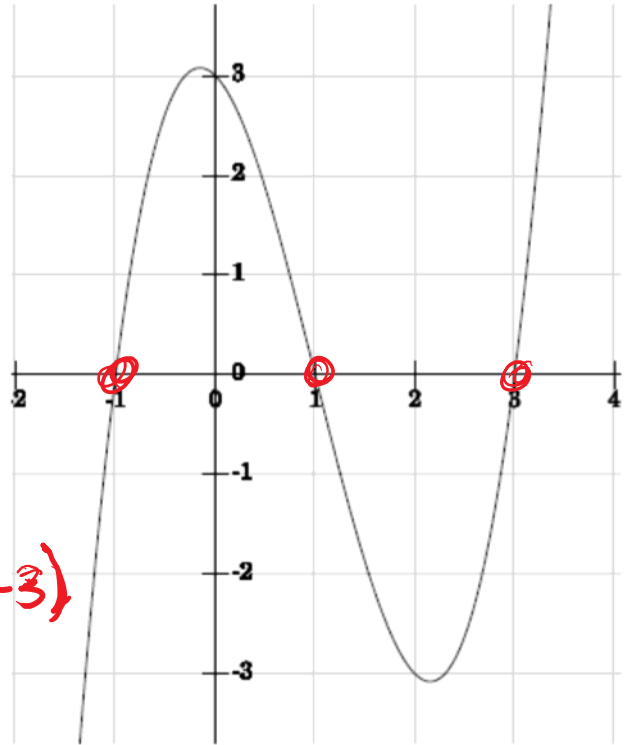
$$= \frac{\sqrt{144}}{\sqrt{49}} = \frac{12}{7}$$

49. The maximum or minimum of a parabola is called the Vertex.

50. Which function is represented by the graph on the right?

x -int's
 $x = -1 \Rightarrow (x+1)$
 $x = 1 \Rightarrow (x-1)$
 $x = 3 \Rightarrow (x-3)$

↓
 EQ.
 $y = (x+1)(x-1)(x-3)$



51. Find the values of x for which $f(x) = 0$, for the function $f(x) = 6x^2 - 11x - 10$.

$a = 6$ $b = -11$ $c = -10$
 $0 = 6x^2 - 11x - 10$ Not Factorable
 $x = \frac{-(-11) \pm \sqrt{(-11)^2 - 4(6)(-10)}}{2(6)} = \frac{11 \pm \sqrt{11 + 240}}{12} = \frac{11 \pm \sqrt{251}}{12} = \frac{11 \pm 15.84}{12}$
 $x = 2.23$
 $x = -0.40$

52. Identify the x-intercepts and y-intercept for the function $f(x) = 4x^2 - 20x + 25$.

Factor or
Quadratic

(0, 25)

$0 = (2x-5)(2x-5)$

$0 = 2x-5$

$\frac{5}{2} = x \rightarrow x\text{-int}(\frac{5}{2}, 0)$

53. Aubrey threw a rock straight up into the air with an initial velocity from a point above ground. The vertical motion model representing this situation is, $h = -16t^2 + 32t + 10$, identify the initial velocity of the model.

32 ft/sec is the velocity
the middle term

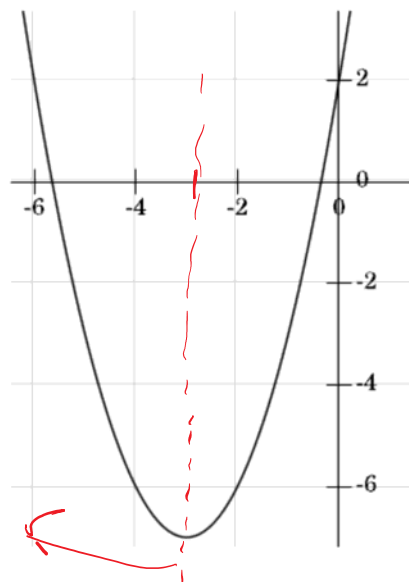
54. What number must be added to both sides of the equation to complete the square? ~~$x^2 - 20x - 15$~~

$$y = (x - 5)^2 + 7 \quad \text{what is the vertex?}$$

\uparrow \uparrow
 opp same $(5, 7)$

55. Identify the axis of symmetry of the parabola in the graph on the right.

Axis of
symm
 $x = -3$



56. A model rocket is launched from the roof top of a building. Its flight path is modeled by $h = -16t^2 + 32t + 5$, where h is the height of the rocket above the ground in meters and t is the time after the launch in seconds. Find the maximum height the rocket will reach during its flight path.

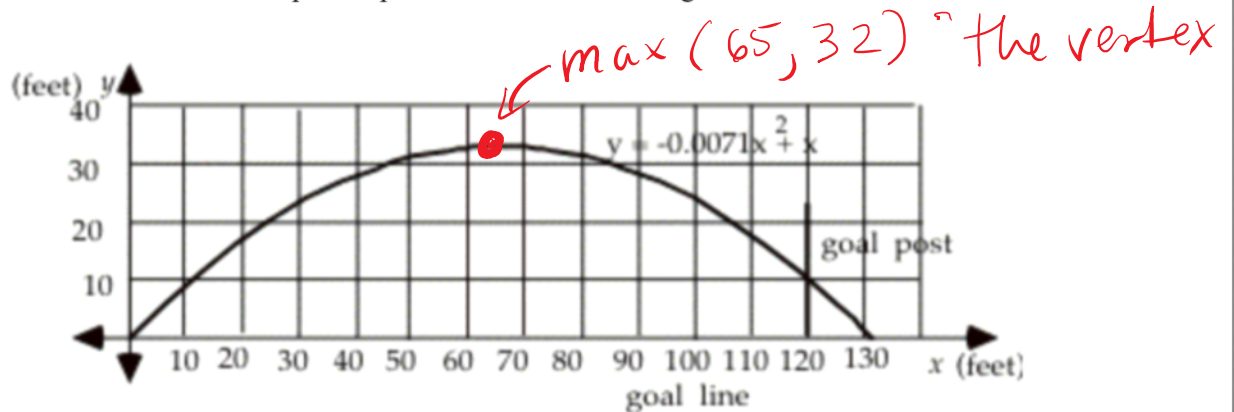
$(1, 21)$ \leftarrow vertex or $x = \frac{-32 \pm \sqrt{32^2 - 4(-16)(5)}}{2(-16)}$
 $\boxed{x = 1}$ $h = -16(1)^2 + 32(1) + 5$
 $\boxed{h = 21}$

57. What are the roots of the quadratic equation $-2x^2 + 7x + 4 = 0$? *Quadratic*
Give the exact roots and the approximation(decimal) answers.

$$x = \frac{-7 \pm \sqrt{7^2 - 4(-2)(4)}}{2(-2)} = \frac{-7 \pm \sqrt{81}}{-4} = \frac{-7 \pm 9}{-4}$$

$\frac{7+9}{4} = 4$
 $\frac{7-9}{4} = \frac{-2}{4} = -\frac{1}{2}$

58. The graph shows the path of a football during a field goal kick. The path the football travels can be modeled by $y = -0.0071x^2 + x$, where y represents the height of the rocket and x represents the horizontal distance. What point represents the maximum height of the football in the air?



59. What term should you add to $x^2 + 20x$, to create a perfect square trinomial?

$$x^2 + 20x + \boxed{100} \quad \text{Add } \boxed{100}$$

$$\left(\frac{20}{2}\right)^2 = (10)^2 = 100$$

60. Solve $x^2 - 10x = 12$ by completing the square.

$$x^2 - 10x + \boxed{25} = 12 + \boxed{25}$$

$$\left(\frac{-10}{2}\right)^2 = 25$$

$$x^2 - 10x + 25 = 12 + 25$$

$$(x - 5)^2 = 37$$

$$x - 5 = \pm \sqrt{37}$$

$$\boxed{x = 5 \pm \sqrt{37}}$$