

**Campbell High School
Summer Review Packet
Algebra 2**

You are expected to know the following in order to be successful in Algebra 2:

- Factoring polynomials
 - Factor a trinomial with an "a" value other than 1
 - Factor out a GCF
 - Factor difference-of-squares
 - Solving by factoring
- Solving Literal Equations through multiple-steps
- Graphing linear and quadratic functions
 - Finding Slopes
 - Finding Vertex
- Utilize the graphing calculator
- Knowing and using the quadratic formula
- Solving Systems of Equations
 - Graphically
 - Elimination
 - Substitution

Factor completely.

1. $x^2 + 17x + 60$

$$(x+5)(x+12)$$

2. $x^2 - 2x - 63$

$$(x-9)(x+7)$$

3. $x^2 - 12x - 45$

$$(x-15)(x+3)$$

4. $x^2 - 11x + 28$

$$(x-7)(x-4)$$

5. $x^2 - 25y^2$

$$(x+5y)(x-5y)$$

6. $4x^3 - 36x^2$

$$4x^2(x-9)$$

7. $2x^2 - 20x + 50$

$$2(x^2 - 10x + 25)$$

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

8. $-x^2 - 12x - 36$

$$-(x^2 + 12x + 36)$$

$$-(x+6)^2$$

9. $3x^2 + 17x - 28$

$$(3x-4)(x+7)$$

10. $15x^2 - 2x - 24$

$$(5x+6)(3x-4)$$

11. $16x^2 + 24x + 9$

$$(4x+3)^2$$

12. $6x^2 - 11x - 21$

$$(6x+7)(x-3)$$

13. $2x^2 - 6x + 5xy - 15y$

$$2x(x-3) + 5y(x-3)$$

$$(2x+5y)(x-3)$$

14. $-28x^2 + 7xy + 2y - 8x$

$$-7x(4x-y) - 2(4x-y)$$

$$(-7x-2)(4x-y)$$

Solve. Leave all answers in simplest radical form where appropriate.

⑮. $x^2 + 8 = 28$

$$x^2 = 20$$

$$x = \pm 2\sqrt{5}$$

16. $2n^2 = -144$

$$n^2 = -72$$

No Real Solution

⑰. $x^2 - 5 = 73$

$$x^2 = 78$$

$$x = \pm \sqrt{78}$$

18. $10n^2 + 2 = 292$

$$10n^2 = 290$$

$$n^2 = 29$$

$$n = \pm \sqrt{29}$$

19. $2x^2 - 3x - 5 = 0$

$$(2x - 5)(x + 1) = 0$$

$$2x - 5 = 0 \quad x + 1 = 0$$

$$x = 5/2 \quad x = -1$$

20. $2m^2 - 7m - 13 = -10$

$$2m^2 - 7m - 3 = 0$$

$$\frac{-(-7) \pm \sqrt{(-7)^2 - 4(2)(-3)}}{2(2)} = \frac{7 \pm \sqrt{73}}{4}$$

⑰. $2x^2 - 36 = 6$

$$2x^2 = 42$$

$$x^2 = 21$$

$$x = \pm \sqrt{21}$$

22. $k^2 - 31 - 2k = -6 - 3k^2 - 2k$

$$4k^2 = 25$$

$$k^2 = \frac{25}{4}$$

$$k = \pm \frac{5}{2}$$

Solve by factoring.

23. $x^2 - 11x + 19 = -5$

$$x^2 - 11x + 24 = 0$$

$$(x - 8)(x - 3) = 0$$

$$x = 8 \quad x = 3$$

25. $-4k^2 - 8k - 3 = -3 - 5k^2$

$$k^2 - 8k = 0$$

$$k(k - 8) = 0$$

$$k = 0 \quad k = 8$$

27. $8x^2 + 21 = -59x$

$$8x^2 + 59x + 21 = 0$$

$$(4x + 7)(2x + 3) = 0$$

24. $7r^2 - 14r = -7$

$$7r^2 - 14r + 7 = 0$$

$$7(r^2 - 2r + 1) = 0$$

$$7(r - 1)^2 = 0 \quad r = 1$$

26. $7x^2 + 2x = 0$

$$x(7x + 2) = 0$$

$$x = 0 \quad x = -\frac{2}{7}$$

28. $15a^2 - 3a = 3 - 7a$

$$15a^2 + 4a - 3 = 0$$

$$(5a + 3)(3a - 1) = 0$$

$$a = -3/5 \quad a = 1/3$$

Solve for the variable indicated.

29. $d = rt$ for t

$$\frac{d}{r} = \frac{rt}{r}$$

$$t = \frac{d}{r}$$

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

$$b_1 = \frac{2A}{h} - b_2$$

31. $I = \frac{PN}{RN+A}$ for N

$$IRN + IA = PN$$

$$IA = PN - IRN$$

$$IA = N(P - IR)$$

32. $A = 2\pi r^2 + 2\pi rh$ for π

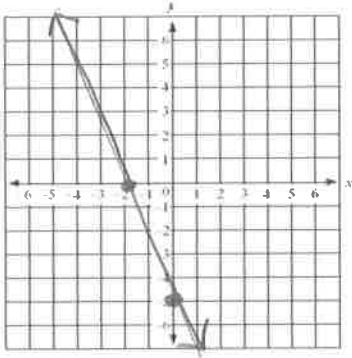
$$A = \pi(2r^2 + 2rh)$$

$$\frac{A}{2r^2 + 2rh} = \pi$$

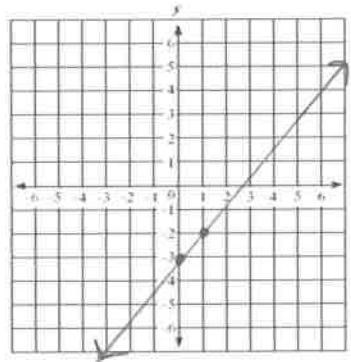
Graph

$$\frac{IA}{P - IR} = N$$

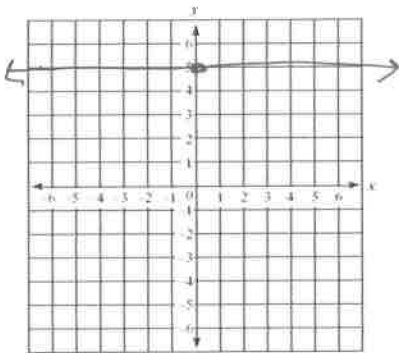
33. $y = -\frac{5}{2}x - 5$



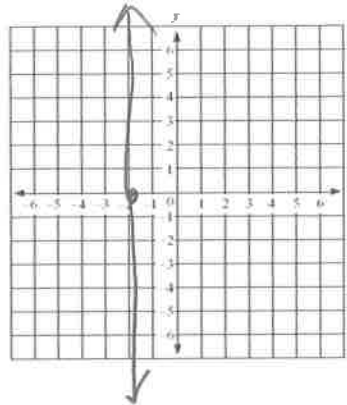
34. $y = x - 3$



35. $y = 5$

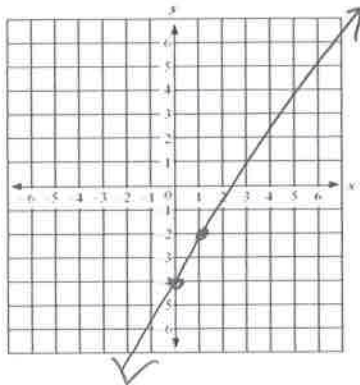


36. $x = -2$



$$-2x + 4$$

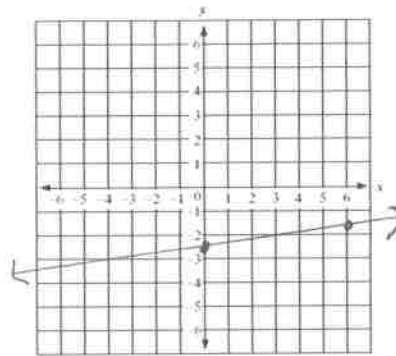
$$37. 2x - y = 4 \quad y = 2x - 4$$



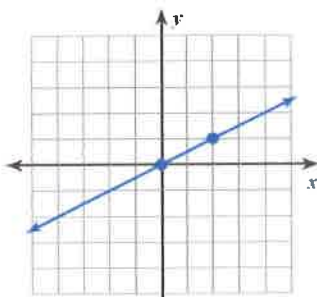
$$-3y = -\frac{1}{2/3}x + 8$$

$$y = \frac{1}{6}x - \frac{8}{3}$$

$$38. \frac{1}{2}x - 3y = 8$$

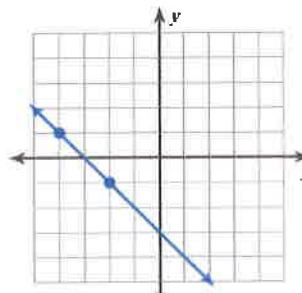


Find the slope.



39.

$$m = \frac{1}{2}$$



40.

$$m = -1$$

$$41. (5, -2)(3, 7)$$

$$m = \frac{7 - (-2)}{3 - 5} = \frac{9}{-2} = -\frac{9}{2}$$

$$42. (-4, 6)(-4, \frac{1}{2})$$

$$\frac{\frac{1}{2} - 6}{-4 - (-4)} = \frac{-\frac{11}{2}}{0} = \text{undefined}$$

Write the equation of the line given the following:

$$43. m = 5, b = -6$$

$$y = 5x - 6$$

$$44. \text{Through the points } (3, 7)(0, -5)$$

$$m = \frac{-5 - 7}{0 - 3} = \frac{-12}{-3} = 4$$

$$y = 4x - 5$$

$$45. \text{Through } (2, -3) \text{ perpendicular to the line } y = -\frac{1}{2}x - 5$$

$$m = 2$$

$$-3 = 2(2) + b$$

$$-3 = 4 + b$$

$$-7 = b$$

$$y = 2x - 7$$

46. Through the point (10, -6) perpendicular to the line $x = 3$

$$y = -6$$

Find the vertex of the following quadratic functions.

47. $f(x) = x^2 - 2x + 3$

$$1^2 - 2(1) + 3 = 1 - 2 + 3 = 2$$

$$-\frac{b}{2a} = \frac{2}{2} = 1$$

(1, 2)

48. $f(x) = 3(x - 5)^2 + 4$

(5, 4)

Find the zeros of the quadratic functions.

49. $f(x) = x^2 + 4x + 4$

$$0 = (x + 2)^2$$

$$x = -2$$

(-2, 0)

50. $f(x) = 7x^2 + 10x - 8$

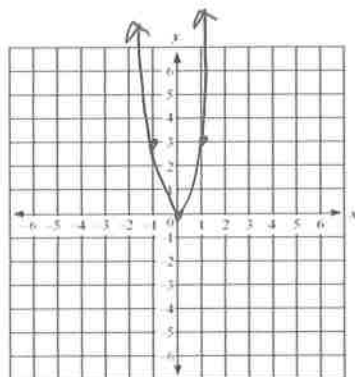
$$0 = (7x - 4)(x + 2)$$

$$x = \frac{4}{7} \quad x = -2$$

($\frac{4}{7}$, 0) (-2, 0)

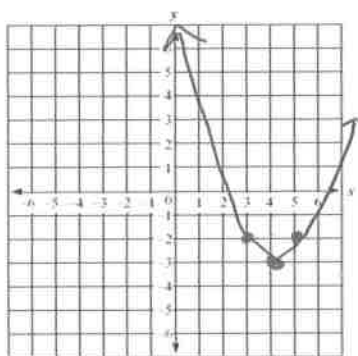
Graph

51. $f(x) = 3x^2$



x	f(x)
-2	$3(-2)^2 = 12$
-1	$3(-1)^2 = 3$
0	$3(0)^2 = 0$
1	$3(1)^2 = 3$
2	$3(2)^2 = 12$

52. $f(x) = x^2 - 8x + 13$



x	f(x)
3	-2
4	-3
5	-2

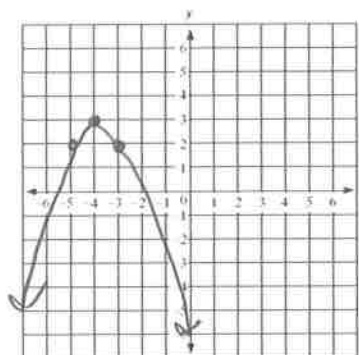
$$-\frac{b}{2a} = \frac{8}{2} = 4 \quad (4, -3)$$

$$4^2 - 8(4) + 13 = 16 - 32 + 13 = -3$$

$$3^2 - 8(3) + 13 = 9 - 24 + 13$$

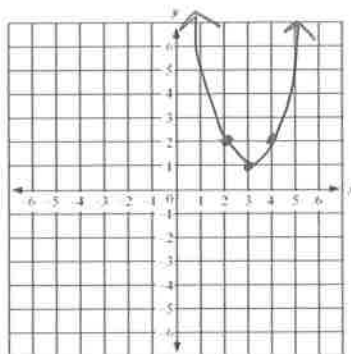
53. $f(x) = -x^2 - 8x - 13$

$-\frac{b}{2a} = \frac{8}{-2} = -4$



x	f(x)
-3	2
-4	3
-5	2

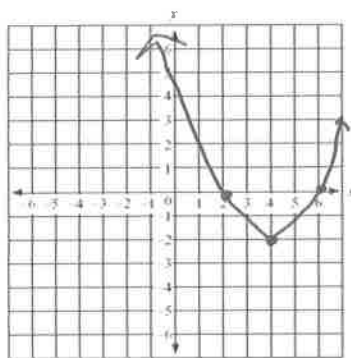
54. $f(x) = (x - 3)^2 + 1$



x	f(x)
2	2
3	1
4	2

55. $f(x) = \frac{1}{2}(x - 4)^2 - 2$

x	f(x)
2	0
4	-2
6	0



Use the discriminant to determine the number and types of solutions to the quadratic equation.

56. $x^2 - 3x + 2 = 0$

$b^2 - 4ac$

$9 - 4(1)(2)$

$9 - 8 = 1$ Two Real Rational

57. $-3x^2 - 7x + 14 = 0$

$49 - 4(-3)(14)$

$49 + 168 = 217$

Two Real Irrational

58. $x^2 - 5x - 14 = 0$

$25 - 4(1)(-14)$

$25 + 56$

81

Two Real Rational

59. $x^2 - 2 + 1 = 0$

$x^2 - 1 = 0$

$a = 1 \quad b = 0 \quad c = -1$

$0 - 4(1)(-1)$

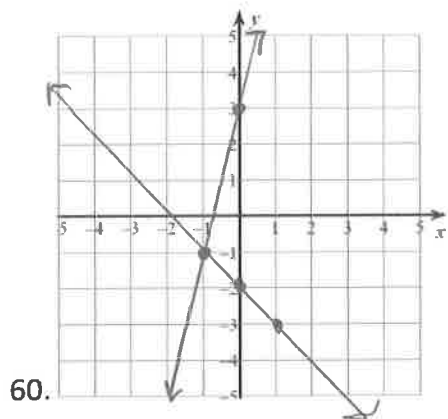
$0 + 4$

4

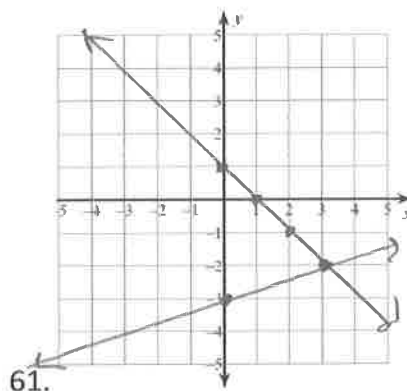
Two Real Rational

Solve the system of equations by graphing.

$$\begin{aligned} y &= 4x + 3 \\ y &= -x - 2 \end{aligned} \quad (-1, -1)$$



$$\begin{aligned} y &= \frac{1}{3}x - 3 \\ y &= -x + 1 \end{aligned} \quad (3, -2)$$



Solve.

62.

$$\begin{aligned} x - y &= 11 \\ 2x + y &= 19 \\ \hline 3x &= 30 \\ x &= 10 \quad y = -1 \end{aligned}$$

64.

$$\begin{aligned} -3x + 3y &= 4 \\ -x + y &= 3 \\ y &= x + 3 \\ -3x + 3(x + 3) &= 4 \\ -3x + 3x + 9 &= 4 \\ 9 &= 4 \\ \text{No Solution} \end{aligned}$$

63.

$$\begin{aligned} -3(-7x + y = -19) &= 21x - 3y = 57 \\ -2x + 3y &= -19 \\ \hline 19x &= 38 \\ x &= 2 \quad y = -5 \end{aligned}$$

65.

$$\begin{aligned} 2x + y &= 20 \\ 6x - 5y &= 12 \\ y &= -2x + 20 \\ 6x - 5(-2x + 20) &= 12 \\ 6x + 10x - 100 &= 12 \\ 16x &= 112 \\ x &= 7 \quad y = 6 \\ 2(7) + y &= 20 \\ 14 + y &= 20 \\ y &= 6 \end{aligned}$$