

1. False
2. Two solutions— some combination of real and or imaginary numbers.
3. Parabola
4. Factoring, Quadratic Formula, Completing the Square, Square-Roots of both sides
5. $2x^2 + 3x - 5 = 0$
6. 33, discriminant is positive, the equation has 2 real roots/solutions.

$$6x^2 - 3x - 1 = 0$$

$$a = 6 \quad b = -3 \quad c = -1$$

$$\text{Discriminant} = b^2 - 4ac$$

$$(-3)^2 - 4(6)(-1)$$

$$9 + 24 = 33$$

$$7. \quad x = -4 \pm \sqrt{6}$$

$$x^2 + 8x = -10$$

$$x^2 + 8x + \left(\frac{8}{2}\right)^2 = -10 + \left(\frac{8}{2}\right)^2$$

$$x^2 + 8x + 16 = -10 + 16$$

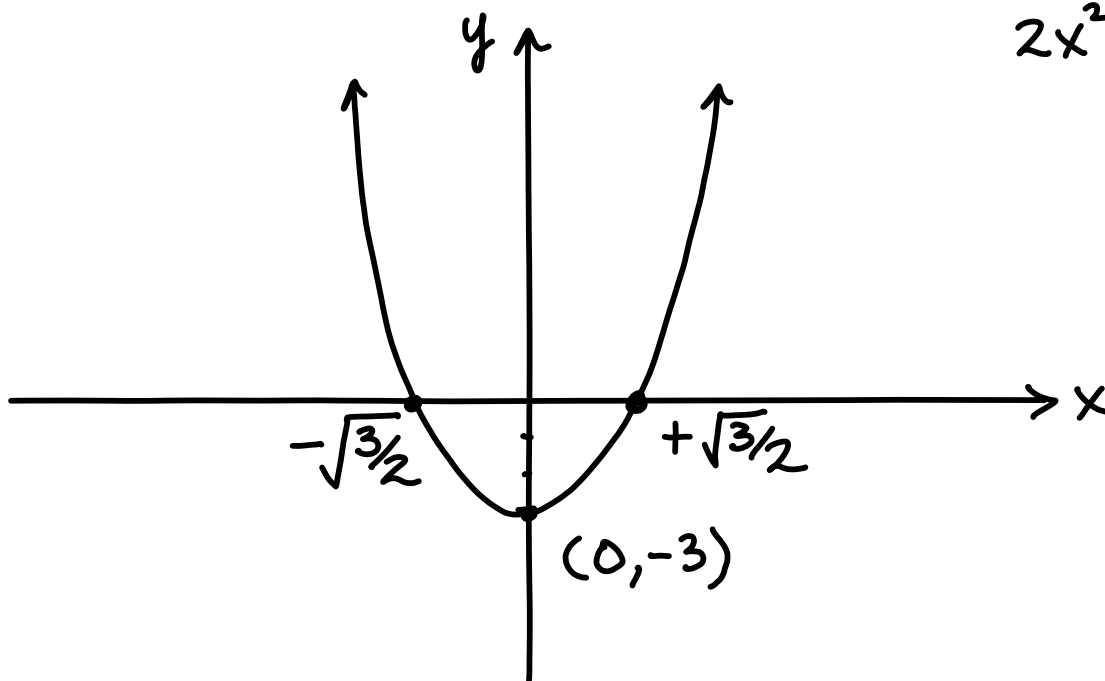
$$(x + 4)^2 = 6$$

$$\sqrt{(x + 4)^2} = \sqrt{6}$$

$$x + 4 = \pm \sqrt{6}$$

$$x = -4 \pm \sqrt{6}$$

$$8. \quad \text{Graph } f(x) = 2x^2 - 3$$



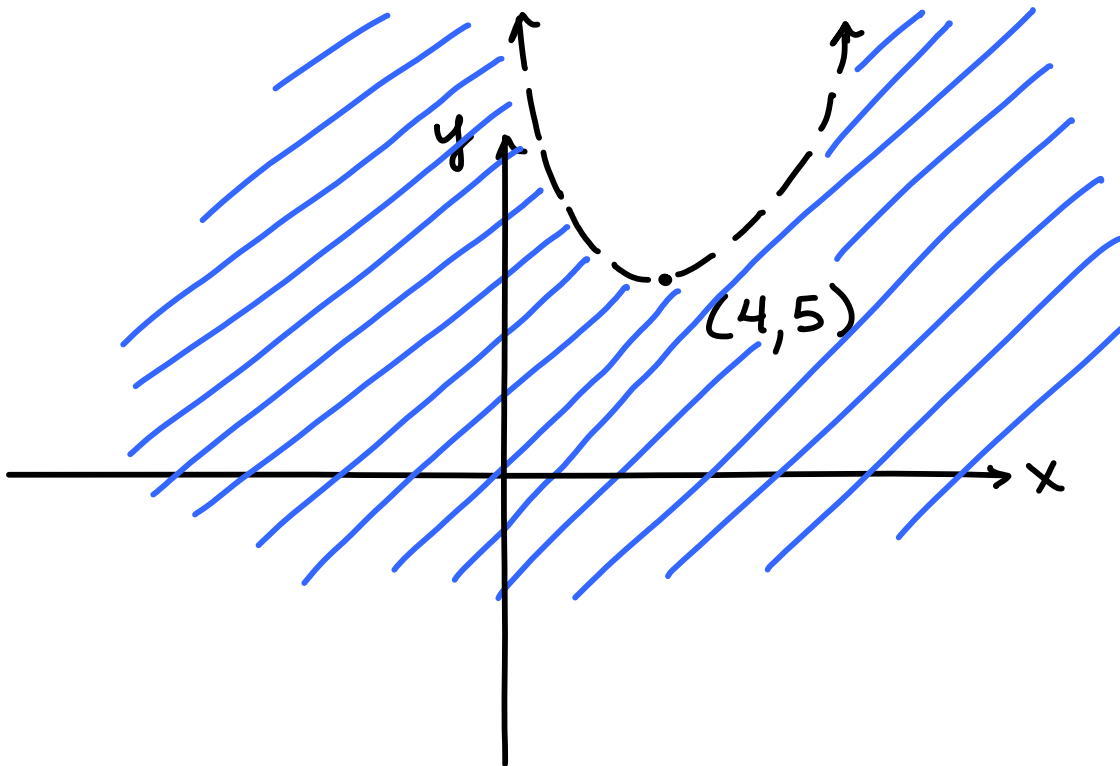
$$2x^2 - 3 = 0$$

$$2x^2 = 3$$

$$x^2 = 3/2$$

$$x = \pm \sqrt{3/2}$$

9. Graph $f(x) < (x-4)^2 + 5$



10. $x = \pm 5$ (must indicate ± 5 not just 5)

$$x^2 = 25$$

$$x = \sqrt{25}$$

$$x = \pm 5$$

11. $x = \pm 3$

$$4x^2 - 1 = 35$$

$$4x^2 = 36$$

$$x^2 = 9$$

$$x = \sqrt{9} = \pm 3$$

12. $x = \pm 4$

$$3(x^2 - 4) + 4x^2 = 20 + 5x^2$$

$$3x^2 - 12 + 4x^2 = 20 + 5x^2$$

$$7x^2 - 12 = 20 + 5x^2$$

$$2x^2 = 32$$

$$x^2 = 16$$

$$x = \sqrt{16} = \pm 4$$

13. $x_1 = 0, x_2 = -3$

$$4x^2 + 12x = 0$$

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

$$4x = 0 \quad x + 3 = 0$$

$$x_1 = 0$$

$$x_2 = -3$$

14. $x_1 = 4, x_2 = -9$

$$(x - 4)(x + 9) = 0$$

$$x - 4 = 0 \quad x + 9 = 0$$

$$x_1 = 4$$

$$x_2 = -9$$

15. $x_1 = -1, x_2 = -5$

$$\frac{25(x+3)^2}{25} = \frac{100}{25}$$

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

$$\sqrt{(x+3)^2} = \sqrt{4}$$

$$x+3 = \pm 2$$

$$x = -3 \pm 2$$

$$x_1 = -3 + 2$$
$$= -1$$

$$x_2 = -3 - 2$$
$$= -5$$

16. $x_1 = 6$

$x_2 = -2$

$$5x^2 = 20x + 60$$

$$5x^2 - 20x - 60 = 0$$

$$\frac{5(x^2 - 4x - 12)}{5} = \frac{0}{5}$$

$$x^2 - 4x - 12 = 0$$

$$(x-6)(x+2) = 0$$

$$x-6=0 \quad x+2=0$$

$$x_1 = 6$$

$$x_2 = -2$$

$$17. x = \frac{-3 \pm \sqrt{13}}{2}$$

$$4x^2 + 12x - 4 = 0$$

$$4(x^2 + 3x - 1) = 0$$

$$x^2 + 3x - 1 = 0$$

$$a=1 \quad b=3 \quad c=-1$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(3) \pm \sqrt{(3)^2 - 4(1)(-1)}}{2(1)}$$

$$x = \frac{-3 \pm \sqrt{9+4}}{2}$$

$$x = \frac{-3 \pm \sqrt{13}}{2}$$

$$18. \quad x_1 = -\frac{1}{4} \quad x_2 = -3$$

$$4w^2 + 13w = -3$$

$$4w^2 + 13w + 3 = 0$$

$$a = 4 \quad b = 13 \quad c = 3$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(13) \pm \sqrt{(13)^2 - 4(4)(3)}}{2(4)}$$

$$x = \frac{-13 \pm \sqrt{169 - 48}}{8}$$

$$x = \frac{-13 \pm \sqrt{121}}{8}$$

$$x = \frac{-13 \pm 11}{8}$$

$$x_1 = \frac{-13 + 11}{8} \quad x_2 = \frac{-13 - 11}{8}$$

$$x_1 = \frac{-2}{8} = -\frac{1}{4} \quad x_2 = \frac{-24}{8} = -3$$

$$19. \quad x_1 = -1 \quad x_2 = -\frac{3}{7}$$

$$\begin{aligned} -3 - 7y^2 &= 10y \\ -7y^2 - 10y - 3 &= 0 \\ a &= -7 \quad b = -10 \quad c = -3 \end{aligned}$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(-10) \pm \sqrt{(-10)^2 - 4(-7)(-3)}}{2(-7)}$$

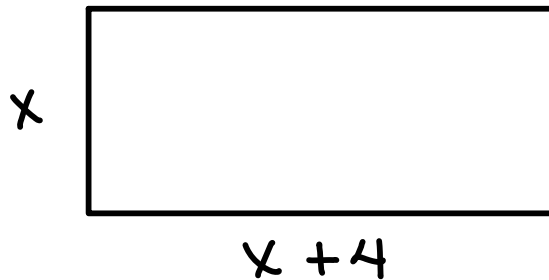
$$x = \frac{10 \pm \sqrt{100 - 84}}{-14}$$

$$x = \frac{10 \pm \sqrt{16}}{-14}$$

$$x = \frac{10 \pm 4}{-14}$$

$$x_1 = \frac{10 + 4}{-14} = \frac{14}{-14} = -1 \quad x_2 = \frac{10 - 4}{-14} = \frac{6}{-14} = -\frac{3}{7}$$

20. $w = 6''$ $l = 10''$



$$\text{area} = l \cdot w = (x + 4)x$$

Solve $x(x + 4) = 60$

$$x^2 + 4x - 60 = 0$$

$$(x - 6)(x + 10) = 0$$

$$x - 6 = 0 \quad x + 10 = 0$$

(solution) $x = 6$

~~$x = -10$~~

distance
can't be
negative

$w = 6''$ $l = 6'' + 4'' = 10''$