ANSWER PRESENTATION TOOL

1. $x^2 - 4x + 3 = 0$

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

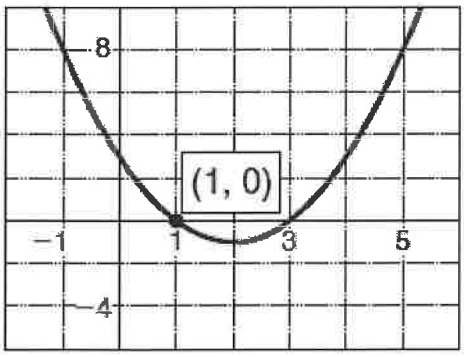
$$x = \frac{-(-4) \pm \sqrt{(-4)^2 - 4(1)(3)}}{2(1)}$$

$$x = \frac{4 \pm \sqrt{4}}{2}$$

$$x = \frac{4 \pm 2}{2}$$

$$x = 2 \pm 1$$

So, the solutions are $x = 1$ and $x = 3$.



3. $x^2 + 6x + 15 = 0$

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

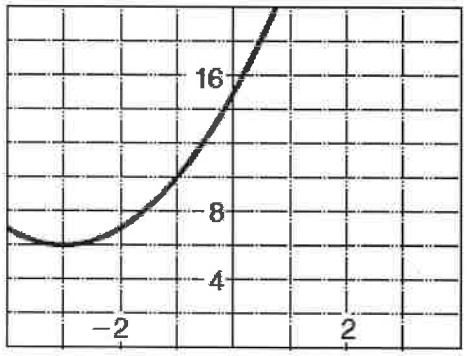
$$x = \frac{-6 \pm \sqrt{6^2 - 4(1)(15)}}{2(1)}$$

$$x = \frac{-6 \pm \sqrt{-24}}{2}$$

$$x = \frac{-6 \pm 2i\sqrt{6}}{2}$$

$$x = -3 \pm i\sqrt{6}$$

So, the solutions are $x = -3 - i\sqrt{6}$ and $x = -3 + i\sqrt{6}$.



5. $x^2 - 14x = -49$

$x^2 - 14x + 49 = 0$

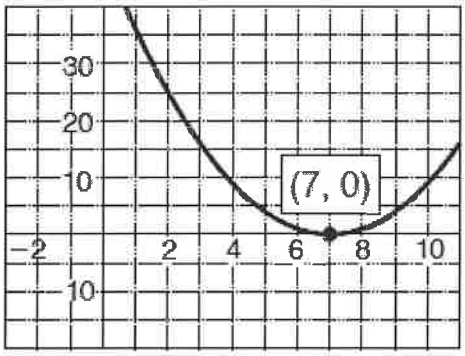
$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(-14) \pm \sqrt{(-14)^2 - 4(1)(49)}}{2(1)}$$

$$x = \frac{14 \pm 0}{2}$$

$$x = 7$$

So, the solution is $x = 7$.



7. $3x^2 + 5 = -2x$

$3x^2 + 2x + 5 = 0$

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

$$x = \frac{-2 \pm \sqrt{2^2 - 4(3)(5)}}{2(3)}$$

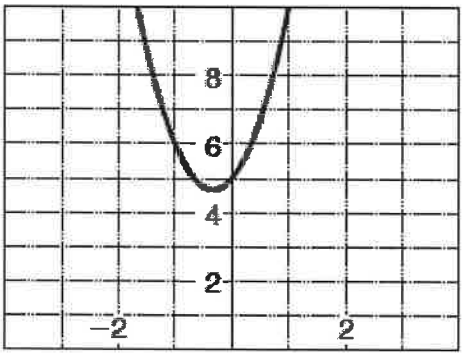
$$x = \frac{-2 \pm \sqrt{-56}}{6}$$

$$x = \frac{-2 \pm 2i\sqrt{14}}{6}$$

$$x = \frac{-1 \pm i\sqrt{14}}{3}$$

So, the solutions are

$x = \dfrac{-1 - i\sqrt{14}}{3}$ and $x = \dfrac{-1 + i\sqrt{14}}{3}$.



9. $-10x = -25 - x^2$

$x^2 - 10x + 25 = 0$

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

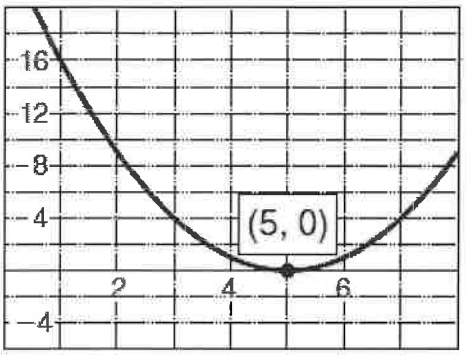
$$x = \frac{-(-10) \pm \sqrt{(-10)^2 - 4(1)(25)}}{2(1)}$$

$$x = \frac{10 \pm \sqrt{0}}{2}$$

$$x = \frac{10 \pm 0}{2}$$

$$x = 5$$

So, the solution is $x = 5$.



11. $-4x^2 + 3x = -5$

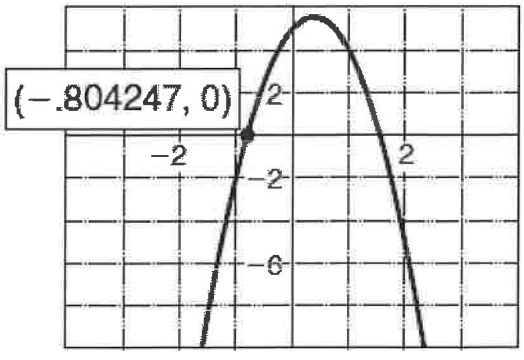
$-4x^2 + 3x + 5 = 0$

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

$$x = \frac{-3 \pm \sqrt{3^2 - 4(-4)(5)}}{2(-4)}$$

$$x = \frac{-3 \pm \sqrt{89}}{-8}$$

So, the solutions are $x = \frac{3 - \sqrt{89}}{8}$ and $x = \frac{3 + \sqrt{89}}{8}$.



13. $-z^2 = -12z + 6$

$-z^2 + 12z - 6 = 0$

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

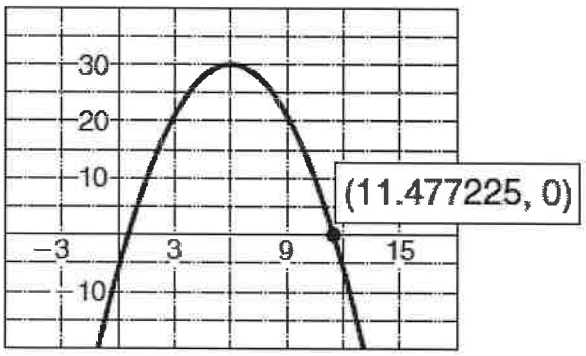
$$z = \frac{-12 \pm \sqrt{12^2 - 4(-1)(-6)}}{2(-1)}$$

$$z = \frac{-12 \pm \sqrt{120}}{-2}$$

$$z = \frac{-12 \pm 2\sqrt{30}}{-2}$$

$$z = 6 \pm \sqrt{30}$$

So, the solutions are $z = 6 - \sqrt{30}$ and $z = 6 + \sqrt{30}$.



15. Equation: $x^2 + 12x + 36 = 0$

Discriminant: $b^2 - 4ac = 12^2 - 4(1)(36) = 0$

The equation has one real solution.

Solution: $x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \dfrac{-12 \pm \sqrt{0}}{2(1)} = -6$

17. Equation: $4n^2 - 4n - 24 = 0$

Discriminant: $b^2 - 4ac = (-4)^2 - 4(4)(-24) = 400$

The equation has two real solutions.

Solutions: $n = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$$n = \frac{-(-4) \pm \sqrt{400}}{2(4)}$$

$$n = \frac{4 \pm 20}{8}$$

$n = -2$ and $n = 3$

19. Equation: $4x^2 - 5x + 10 = 0$

Discriminant: $b^2 - 4ac = (-5)^2 - 4(4)(10) = -135$

The equation has two imaginary solutions.

Solutions: $x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$$x = \frac{-(-5) \pm \sqrt{-135}}{2(4)}$$

$$x = \frac{5 \pm 3i\sqrt{15}}{8}$$

21. Equation: $3x^2 + 24x + 48 = 0$

Discriminant: $b^2 - 4ac = 24^2 - 4(3)(48) = 0$

The equation has one real solution.

Solution: $x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \dfrac{-24 \pm \sqrt{0}}{2(3)} = -4$

23. C; The discriminant is $(-6)^2 - 4(1)(25) = -64$, so the graph has no x-intercepts.

25. A; The discriminant is $6^2 - 4(3)(-9) = 144$, so the graph has two x-intercepts and a y-intercept of -9.

27. The square root is an imaginary number, not a real number.

$x^2 + 10x + 74 = 0$

$$x = \frac{-10 \pm \sqrt{100^2 - 4(1)(74)}}{2(1)}$$

$$= \frac{-10 \pm \sqrt{-196}}{2}$$

$$= \frac{-10 \pm 14i}{2}$$

$$= -5 \pm 7i$$

$$= -5 - 7i \quad \text{or} \quad -5 + 7i$$

29. *Sample answer:* For a quadratic equation to have two imaginary solutions, the discriminant must be negative. So, set the discriminant equal to any negative number.

$b^2 - 4ac = -12$

$4^2 - 4ac = -12$

$16 - 4ac = -28$

$-4ac = -28$

$ac = 7$

Because $ac = 7$, choose two integers whose product is 7, such as $a = 1$ and $c = 7$. So, one possible equation is $x^2 + 4x + 7 = 0$.