

1. Find the quadratic function that passes through the points (-1,-7) (1,5) (2,17)

$$y = 2x^2 + 6x - 3$$

2. Find the quadratic function with a vertex (3,5) that passes through the point (4,7). Then transform to vertex form.

$$y = 2x^2 - 12x + 23$$

$$y - 23 = 2(x^2 - 6x + 9) + 18$$

(2, 7)

$$y - 5 = 2(x - 3)^2$$

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

3. A ball is hit into the air from a tee 3 feet above the ground. The height, h (in feet) that the ball is above the ground, t (seconds) after being hit is given by the formula: $h(t) = -16t^2 + 56t + 3$.

At what time(s) is the ball 20 feet above the ground?

$$20 = -16t^2 + 56t + 3$$

$$0 = -16t^2 + 56t - 17$$

$$x = \frac{-56 \pm \sqrt{56^2 - 4(-16)(-17)}}{-32}$$

OR.

Find intersection of $h(t)$ and $y = 20$

$$t = .34 \text{ sec} \\ = 3.16 \text{ sec}$$

Solve.

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

$$x = \frac{-5 \pm \sqrt{25 - 12}}{2}$$

$$x = \frac{-5 \pm \sqrt{13}}{2}$$

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

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

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

$$x = 3/2, -1$$

6. $(x+4)^2 = -16$

$$x + 4 = \pm 4i$$

$$x = -4 \pm 4i$$

7. $x^2 + 10x + 29 = 0$

$$x = \frac{-10 \pm \sqrt{100 - 4 \cdot 29}}{2}$$

$$= \frac{-10 \pm \sqrt{-16}}{2} = \frac{-10 \pm 4i}{2}$$

$$x = -5 \pm 2i$$

Find the equation of the quadratic with the following:

8. Solutions: $2+5i, 2-5i$

$$x = 2 \pm 5i$$

$$(x-2) = (\pm 5i)^2$$

$$x^2 - 4x + 4 = -25$$

$$\boxed{x^2 - 4x + 29 = 0}$$

9. Solutions: $3+\sqrt{5}, 3-\sqrt{5}$

$$x = 3 \pm \sqrt{5}$$

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

$$x^2 - 6x + 9 = 5$$

$$\boxed{x^2 - 6x + 4 = 0}$$

10. Factor: $3x^3 - 2x^2 - 7x - 2$

$$2 \begin{array}{r|rrrr} 3 & -2 & -7 & -2 \\ \downarrow & 6 & 8 & 2 \\ \hline 3 & 4 & 1 & 0 \end{array}$$

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

$$\boxed{(x-2)(3x+1)(x+1)}$$

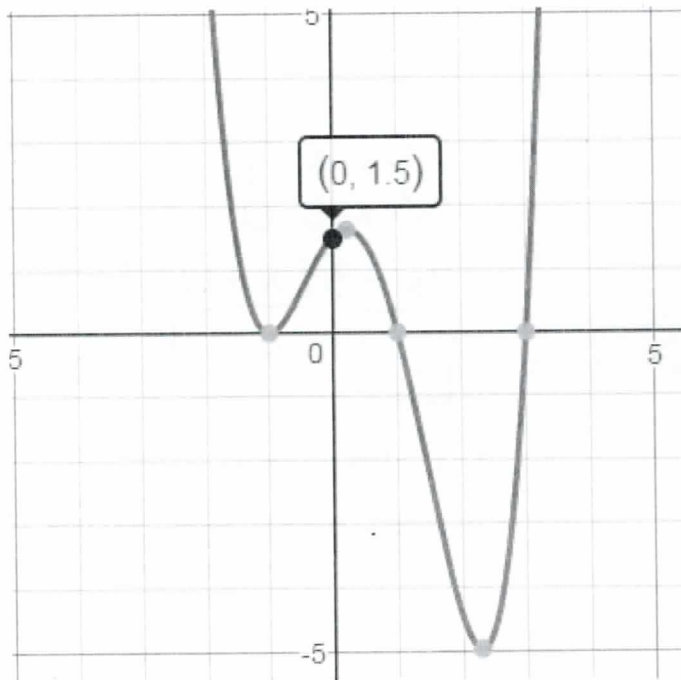
11. $8x^2 + 50$

$$2(4x^2 + 25)$$

$$\boxed{2(2x+5i)(2x-5i)}$$

Write the equation of the polynomial function in factored form.

12.



$$y = a(x+1)^2(x-1)(x-3)$$

$$1.5 = a(1)^2(-1)(-3)$$

$$1.5 = 3a$$

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

$$\boxed{y = \frac{1}{2}(x+1)^2(x-1)(x-3)}$$