

Finding Characteristics with Equations

#17

Standard Form: _____

Vertex Form: _____

Intercept Form: _____

Identify the vertex, axis of symmetry, extrema and y-intercept.

1. $y = 2(x + 2)^2 - 9$

2. $y = -(x + 4)(x - 2)$

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

4. $y = (x + 6)(x + 2)$

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

6. $y = 4x^2 - 16x$

7. $y = \frac{1}{2}x^2 - 6$

8. $y = 2(x - 5)(x - 1)$

Finding Characteristics with Equations

#17

Standard Form: $y = ax^2 + bx + c$ Vertex Form: $y = a(x-h)^2 + k$ Intercept Form: $y = a(x-p)(x-q)$

Identify the vertex, axis of symmetry, extrema and y-intercept.

1. $y = 2(x+2)^2 - 9$

V: $(-2, -9)$

AOS: $x = -2$

ext: min at -9

y-int: $(0, -1)$

$= 2(0+2)^2 - 9$

$= 2(2)^2 - 9$

$= 2(4) - 9$

$= 8 - 9$

$= -1$

2. $y = -(x+4)(x-2)$

AOS: $x = -1$

V: $(-1, 9)$

ext: max at 9

y-int: $(0, 8)$

zeros: $-4, 2$

$y = -(-1+4)(-1-2)$

$= -(3)(-3) = 9$

$y = -(0+4)(0-2)$

$= -(4)(-2)$

$= 8$

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

V: $(2.5, 10.25)$

AOS: $x = 2.5$

ext: max at 10.25

y-int: $(0, 4)$

$x = \frac{-b}{2a} = \frac{-5}{2(-1)} = \frac{-5}{-2}$

$= 2.5$

$y = -(2.5)^2 + 5(2.5) + 4$

$= -6.25 + 12.5 + 4$

$= 10.25$

4. $y = (x+6)(x+2)$

AOS: $x = -4$

V: $(-4, -4)$

ext: min at -4

y-int: $(0, 12)$

zeros: $-6, -2$

$y = (-4+6)(-4+2)$

$= (2)(-2)$

$= -4$

$y = (0+6)(0+2)$

$= (6)(2)$

$= 12$

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

V: $(5, 0)$

AOS: $x = 5$

ext: max at 0

y-int: $(0, -25)$

$y = -(0-5)^2$

$= -(-5)^2$

$= -25$

6. $y = 4x^2 - 16x$

V: $(2, -16)$

AOS: $x = 2$

ext: min at -16

y-int: $(0, 0)$

$x = \frac{-b}{2a} = \frac{-(-16)}{2(4)} = \frac{16}{8} = 2$

$y = 4(2)^2 - 16(2)$

$= 4(4) - 32$

$= 16 - 32$

$= -16$

7. $y = \frac{1}{2}x^2 - 6$

V: $(0, -6)$

AOS: $x = 0$

ext: min at -6

y-int: $(0, -6)$

$x = \frac{-b}{2a} = \frac{-0}{2(\frac{1}{2})} = \frac{0}{1} = 0$

$y = \frac{1}{2}(0)^2 - 6$

$= 0 - 6$

$= -6$

8. $y = 2(x-5)(x-1)$

AOS: $x = 3$

V: $(3, -8)$

ext: min at -8

y-int: $(0, 10)$

zeros: $5, 1$

$y = 2(3-5)(3-1)$

$= 2(-2)(2)$

$= -8$

$y = 2(0-5)(0-1)$

$= 2(-5)(-1)$

$= 10$