

ID key features of quadratics WS.

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

a) concave down \searrow ($a = -2$)

b) $(3, 4)$

c) $x = 3$ mmchly 6.0.

d) $(0, -14)$ $-2(0-3)^2 + 4$
work: $-2(9) + 4$

2) $y = (x-9)^2 - 25$

a) concave up \nearrow

b) $(9, -25)$

c) $x = 9$

d) $(0, 56)$
work: $(0-9)^2 - 25$

3) $y = 3(x+5)^2 - 8$

a) concave up

b) $(-5, -8)$

c) $x = -5$

d) $(0, 67)$
work: $3(0+5)^2 - 8$

4) $y = -8(x+9)^2 + 12$

a) concave down

b) $(-9, 12)$

c) $x = -9$

d) $(0, -636)$

work: $-8(0+9)^2 + 12$

5) $y = -(x+16)^2 - 24$

a) concave down

b) $(-16, -24)$

c) $x = -16$

d) $(0, -280)$

work: $-1(0+16)^2 - 24$

6) $y = 2(x-7)^2 - 11$

a) concave up

b) $(7, -11)$

c) $x = 7$

d) $(0, 87)$

w: $2(0-7)^2 - 11$

7) $y = -3(x-21)^2 + 16$

a) concave down

b) $(21, 16)$

c) $x = 21$

d) $(0, -1307)$

w: $-3(0-21)^2 + 16$

8) $y = 2(x+3)^2 + 6$

a) concave up

b) $(-3, 6)$

c) $x = -3$

d) $(0, 24)$

w: $2(0+3)^2 + 6$

9) $y = -(x+4)^2 + 12$

a) concave down

b) $(-4, 12)$

c) $x = -4$

d) $(0, -4)$

w: $-(0+4)^2 + 12$

10) $y = 5(x-6)^2 - 7$

a) concave up

b) $(6, -7)$

c) $x = 6$

d) $(0, 173)$

w: $5(0-6)^2 - 7$

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

a) concave up

b) $(3, 5)$

c) $x = 3$

d) $(0, 23)$

w: $(0-3)^2 + 5$

12) $y = -3(x+9)^2 - 3$

a) concave down

b) $(-9, -3)$

c) $x = -9$

d) $(0, -246)$

w: $-3(0+9)^2 - 3$

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13) $y = -4x^2 + 32x - 3$

a) concave down

b) $(4, 61)$

$$x_v = \frac{-32}{2(-4)} = 4$$

$$y_v = -4(4)^2 + 32(4) - 3$$

c) $x = 4$

d) $(0, -3)$

14) $y = x^2 + 10x + 20$

a) concave up

b) $(-5, 5)$

$$x_v = \frac{-10}{2(1)} = -5$$

$$y_v = (-5)^2 + 10(-5) + 20$$

c) $x = -5$

d) $(0, 20)$

15) $y = 2x^2 - 20x + 8$

a) concave up

b) $(5, -42)$

$$x_v = \frac{20}{2(2)} = 5$$

$$y_v = 2(5)^2 - 20(5) + 8$$

c) $x = 5$

d) $(0, 8)$

16) $y = -3x^2 + 30x - 1$

a) concave down

b) $(5, 74)$

$$x_v = \frac{-30}{2(-3)} = 5$$

$$y_v = -3(5)^2 + 30(5) - 1$$

c) $x = 5$

d) $(0, -1)$

17) $y = -x^2 + 4x - 7$

a) concave down

b) $(2, -3)$

$$x_v = \frac{-4}{2(-1)} = 2$$

$$y_v = -(2)^2 + 4(2) - 7$$

c) $x = 2$

d) $(0, -7)$

18) $y = 5x^2 - 60x + 3$

a) concave up

b) $(6, -63)$

$$x_v = \frac{60}{2(5)} = 6$$

$$y_v = 5(6)^2 - 60(6) + 3$$

c) $x = 6$

d) $(0, 3)$

19) $y = -3x^2 - 54x + 8$

a) concave down

b) $(-9, 251)$

$$x_v = \frac{54}{2(-3)} = -9$$

$$y_v = -3(-9)^2 - 54(-9) + 8$$

c) $x = -9$

d) $(0, 8)$

20) $y = 6x^2 + 72x - 20$

a) concave up

b) $(-6, -236)$

$$x_v = \frac{-72}{2(6)} = -6$$

$$y_v = 6(-6)^2 + 72(-6) - 20$$

c) $x = -6$

d) $(0, -20)$

21) $y = -2x^2 + 44x - 3$

a) concave down

b) $(11, 239)$

$$x_v = \frac{44}{2(-2)} = 11$$

$$y_v = -2(11)^2 + 44(11) - 3$$

c) $x = 11$

d) $(0, -3)$

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22) $y = 5x^2 - 70x - 9$

a) concave up

b) $(7, -254)$

$x_v = \frac{70}{2(5)}$

$y_v = 5(7)^2 - 70(7) - 9$

c) $x = 7$

d) $(0, -9)$

23) $y = -4x^2 - 80x + 14$

a) concave down

b) $(-10, 414)$

$x_v = \frac{80}{2(-4)} = -10$

$y_v = -4(-10)^2 - 80(-10) + 14$

c) $x = -10$

d) $(0, 14)$

24) $y = x^2 + 22x - 40$

a) concave up

b) $(-11, -161)$

$x_v = -\frac{22}{2} = -11$

$y_v = (-11)^2 + 22(-11) - 40$

c) $x = -11$

d) $(0, -40)$

25) $y = 3(x-7)(x+5)$

a) concave up

b) $(7, 0)$ & $(-5, 0)$

c) $(1, -108)$

$x_v = \frac{7+5}{2} = 1$

$y_v = 3(1-7)(1+5)$

d) $x = 1$

e) $(0, -105)$

$3(0-7)(0+5)$

26) $y = -(x+4)(x+12)$

a) concave down

b) $(-4, 0)$ & $(-12, 0)$

c) $(-8, 16)$

$x_v = -\frac{4+12}{2} = -8$

$y_v = -(-8+4)(-8+12)$

d) $x = -8$

e) $(0, -48)$

$-1(0+4)(0+12)$

27) $y = -2(x+1)(x-19)$

a) concave down

b) $(-1, 0)$ & $(19, 0)$

c) $(9, 200)$

$x_v = \frac{-1+19}{2} = 9$

$y_v = -2(9+1)(9-19)$

d) $x = 9$

e) $(0, 38)$

$-2(0+1)(0-19)$

28) $y = 5(x-2)(x-24)$

a) concave up

b) $(2, 0)$ & $(24, 0)$

c) $(13, -605)$

$x_v = \frac{2+24}{2} = 13$

$y_v = 5(13-2)(13-24)$

d) $x = 13$

e) $(0, 240)$

$5(0-2)(0-24)$

29) $y = -3(x+5)(x+23)$

a) concave down

b) $(-5, 0)$ and $(-23, 0)$

c) $(-14, 363)$

$x_v = \frac{5+23}{2} = -14$

$y_v = -3(-14+5)(-14+23)$

d) $x = -14$

e) $(0, -345)$

$-3(0+5)(0+23)$

30) $y = 3(x-4)(x+22)$

a) concave up

b) $(4, 0)$ and $(-22, 0)$

c) $(-9, -507)$

$x_v = \frac{4+22}{2} = -9$

$y_v = 3(-9-4)(-9+22)$

d) $x = -9$

e) $(0, -264)$

$3(0-4)(0+22)$

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31) $y = -8(x+1)(x-21)$

a) concave down

b) $(-1, 0)$ & $(21, 0)$

c) $(10, 968)$

$$x_v = \frac{-1+21}{2}$$

$$y_v = -8(10+1)(10-21)$$

d) $x = 10$

e) $(0, 168)$

$$-8(0+1)(0-21)$$

32) $y = 6(x-8)(x+4)$

a) concave up

b) $(8, 0)$ & $(-4, 0)$

c) $(2, -216)$

$$x_v = \frac{8-4}{2}$$

$$y_v = 6(2-8)(2+4)$$

d) $x = 2$

e) $(0, -192)$

$$6(0-8)(0+4)$$

33) $y = -4(x+4)(x+32)$

a) concave down

b) $(-4, 0)$ & $(-32, 0)$

c) $(-18, 784)$

$$x_v = \frac{-4-32}{2} = -18$$

$$y_v = -4(-18+4)(-18+32)$$

d) $x = -18$

e) $(0, -512)$

$$-4(0+4)(0+32)$$

34) $y = -3(x+8)(x-28)$

a) concave down

b) $(-8, 0)$, $(28, 0)$

c) $(10, 972)$

$$x_v = \frac{-8+28}{2}$$

$$y_v = -3(10+8)(10-28)$$

d) $x = 10$

e) $(0, 672)$

$$-3(0+8)(0-28)$$

35) $y = 2(x+11)(x-9)$

a) concave up

b) $(-11, 0)$, $(9, 0)$

c) $(-1, -200)$

$$x_v = \frac{-11+9}{2}$$

$$y_v = 2(-1+11)(-1-9)$$

d) $x = -1$

e) $(0, -198)$

$$y = 2(0+11)(0-9)$$

36) $y = 6(x-12)(x+10)$

a) concave up

b) $(12, 0)$, $(-10, 0)$

c) $(1, -726)$

$$x_v = \frac{12-10}{2}$$

$$y_v = 6(1-12)(1+10)$$

d) $x = 1$

e) $(0, -720)$

$$6(0-12)(0+10)$$