

## Converting Quadratics

The 3 forms of quadratics are:

VERTEX:  $y = a(x-h)^2 + k$     STANDARD:  $y = ax^2 + bx + c$     INTERCEPT:  $y = a(x-p)(x-q)$

### INTERCEPT FORM

- To convert from standard to intercept form, factor.
- To convert from vertex to intercept form, put in standard form and then factor.

1.  $y = x^2 - 3x + 2$

$$y = (x-2)(x-1)$$

6.  $y = 4x^2 + 4x + 1$

$$y = (2x+1)(2x+1)$$

2.  $y = x^2 - 100$

$$y = (x+10)(x-10)$$

7.  $y = 4x^2 + 5x - 6$

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

3.  $y = x^2 + 3x - 18$

$$y = (x+6)(x-3)$$

8.  $y = 12x^2 + 17x + 6$

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

$$y = (x+6)(x-3)$$

4.  $y = x^2 - 2x - 8$

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

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

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

5.  $y = x^2 - x - 132$

$$y = (x-12)(x+11)$$

10.  $y = 15x^2 + 8x - 16$

$$y = (5x-4)(3x+4)$$

### STANDARD FORM

- To convert from intercept to standard form, FOIL the binomials and then distribute the "a" value.
- To convert from vertex to standard form, FOIL the binomials and then distribute the "a" value and then combine the "k" value.

11.  $y = (x-5)(x+2)$

$$y = x^2 - 3x - 10$$

12.  $y = -\frac{1}{4}(4x-5)(x+3)$

$$y = -\frac{1}{4}(4x^2 + 7x - 15)$$

$$y = -x^2 + \frac{7}{4}x - \frac{15}{4}$$

$$13. y = 3(2x-3)(x-1)$$

$$y = \cancel{6}x^2 - 15x + 9$$

$$16. y = 2(x+5) - 23$$

$$y = 2x^2 + 20x + \cancel{27}$$

$$14. y = (3x-2)^2 + 5$$

$$y = 9x^2 - 12x + 9$$

$$17. y = -2(x-11)^2 + 17$$

$$y = -2x^2 + 44x - 225$$

$$15. y = (x-8)^2 + 13$$

$$y = x^2 - 16x + 77$$

$$18. y = (\frac{1}{3}x+4)(2x-5)$$

$$y = \frac{2}{3}x^2 + \frac{19}{3}x - 20$$

#### VERTEX FORM

- To convert from intercept to vertex form, identify the vertex  $(\frac{p+q}{2}, f(\frac{p+q}{2}))$  and the "a" value and plug into vertex form.
- To convert from standard to vertex form, identify the vertex  $(-\frac{b}{2a}, f(-\frac{b}{2a}))$  and the "a" value and plug into vertex form.

$$21. y = x^2 + 8x + 2$$

$$y = (x+4)^2 - 14$$

$$24. y = 4x^2 - 4x + 15$$

$$y = 4(x - \frac{1}{2})^2 + 14$$

$$22. y = x^2 + 12x + 2$$

$$y = (x+6)^2 - 34$$

$$25. y = (x+3)(x-9)$$

$$y = (x-3)^2 - 36$$

$$23. y = -2x^2 + 6x - 3$$

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

$$26. y = 2(x+5)(x+7)$$

$$y = 2(x+6)^2 - 2$$