

U2 Day 8 HW - Finding the Equation of a Parabola from Focus and Directrix KEY

1. Find the standard form quadratic equation given the focus and directrix. **Show all your work.**

a) focus: $(-3, 4)$ directrix: $y = 2$ (no real zeros)

$$y = \frac{1}{4}x^2 + \frac{3}{2}x + \frac{21}{4}$$

b) focus: $(5, -1)$ directrix: $y = -4$

$$y = \frac{1}{6}x^2 - \frac{5}{3}x + \frac{5}{3}$$

c) focus: $(-2, 7)$ directrix: $y = 4$ (no real zeros)

$$y = \frac{1}{6}x^2 + \frac{2}{3}x + \frac{37}{6}$$

d) focus: $(4, -5)$ directrix: $y = -9$

$$y = \frac{1}{8}x^2 - x - 5$$

2. Check your standard form equation with the key and then use p or $-b/2a$ to find the vertex coordinates. Then write the quadratic in vertex form.

a) vertex: $(-3, 3)$ vertex form: $y = \frac{1}{4}(x+3)^2 + 3$

b) vertex: $(5, -2.5)$ vertex form: $y = \frac{1}{6}(x-5)^2 - 2.5$

c) vertex: $(-2, 5.5)$ vertex form: $y = \frac{1}{6}(x+2)^2 + 5.5$

d) vertex: vertex form: $y =$

3. Find the **real** zeros of **ONE** quadratic (your choice) using the quadratic formula. **Show all your work.**

Then use "inside opposite" to write the factored form of the equation.

1. b) zeros: $5 \pm 3\sqrt{5/3}$ factored form: $y = (x - 5 + 3\sqrt{5/3})(x - 5 - 3\sqrt{5/3})$

d) $4 \pm 4\sqrt{7/2}$ $y = (x - 4 + 4\sqrt{7/2})(x - 4 - 4\sqrt{7/2})$