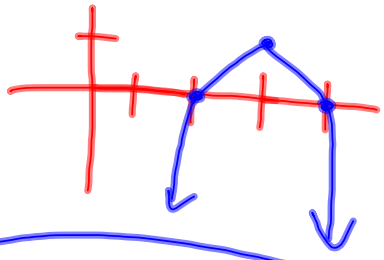
9-1 Day 2

Find the standard form of the equation of the parabola.

Ex 1) vertex: (3, 1) (h, k) points: (2, 0) and (4, 0) (x, y)



$(x-h)^2 = 4p(y-k)$

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

$(2-3)^2 = 4p(0-1)$

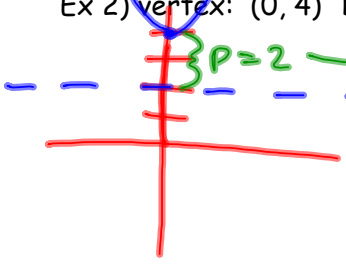
$\frac{1}{-1} = \frac{-4p}{-1}$

$-1 = 4p$

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

Find the standard form of the equation of the parabola.

Ex 2) vertex: (0, 4) (h, k) Directrix: y = 2



$(x-h)^2 = 4p(y-k)$

$(x-0)^2 = 4p(y-4)$

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

$x^2 = 8(y-4)$

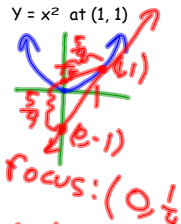
Find the standard form of the equation of the parabola.

Ex 3) vertex: (-2, 0) focus: (-1.5, 0)

Tangent Lines: A line is tangent to a parabola at a point on the parabola if the line intersects, but does not cross, the parabola at a point.

Ex 4) Find an equation of the tangent line and find the x-intercept.

$Y = x^2$ at (1, 1)



$x^2 = 4py$

$4p = 1$

$p = \frac{1}{4}$

focus: $(0, \frac{1}{4})$

$(0, \frac{1}{4})\ (1, 1)$

$d = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$

$d = \sqrt{(1-0)^2+(1-\frac{1}{4})^2}$

$d = \sqrt{1+(\frac{3}{4})^2}$

$d = \sqrt{1+\frac{9}{16}}$

$d = \sqrt{\frac{16}{16}+\frac{9}{16}} = \sqrt{\frac{25}{16}}$

$d = \frac{\sqrt{25}}{\sqrt{16}}$

$d = \frac{5}{4}$ or $1\frac{1}{4}$

$x^2 = y$

$\frac{1}{4} - \frac{5}{4} = \frac{-4}{4} = -1$

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

$(1, 1)\ (0, -1)$

$\frac{\Delta y}{\Delta x} = \frac{-1-1}{0-1} = \frac{-2}{-1} = 2$

$Y = 2X - 1$

x-intercept $\Rightarrow Y = 0$

$0 = 2x - 1$

$1 = 2x$

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

Find an equation of the tangent line and find the x-intercept.

If necessary,,,

Ex 5) $x^2 = 4y$ at (4, 8)