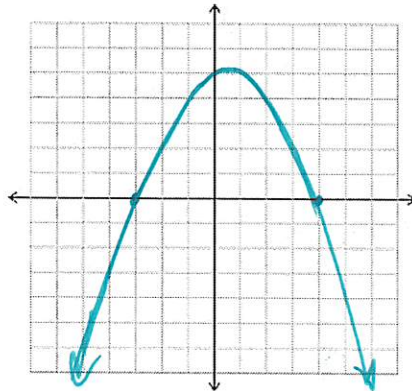


= SOLUTIONS =

1. On the axes below draw **any** quadratic with roots $x = -3$ and $x = 4$.



2. Simplify completely:

$$(-3x^2) (\sqrt[3]{54x^8y^5})$$

$$(-3x^2) \sqrt[3]{54} \sqrt[3]{x^8} \sqrt[3]{y^5}$$

$$(-3x^2) (\sqrt[3]{27} \sqrt[3]{2}) (x^2 \sqrt[3]{x^2}) (y \sqrt[3]{y^2})$$

$$(-3x^2) (3 \sqrt[3]{2}) (x^2 \sqrt[3]{x^2}) (y \sqrt[3]{y^2})$$

$$\boxed{-9x^4y (\sqrt[3]{2x^2y^2})}$$

3. Solve for x:

$$\sqrt{-3x-20} + x = \frac{1}{2}(4x+16)$$

$$\sqrt{-3x-20} + x = 2x + 8$$

$$\sqrt{-3x-20} = x + 8$$

$$-3x - 20 = (x+8)^2$$

$$-3x - 20 = x^2 + 16x + 64$$

$$0 = x^2 + 19x + 84$$

$$0 = (x+12)(x+5)$$

$$x = -12 \quad x = -5$$

check

$$\sqrt{-3(-12)-20} + (-12) \stackrel{?}{=} \frac{1}{2}(4(-12)+16)$$

$$-8 \neq -16$$

$$\sqrt{-3(-5)-20} + (-5) \stackrel{?}{=} \frac{1}{2}(4(-5)+16)$$

$$i\sqrt{5} - 5 \neq -2$$

$\{\emptyset\}$ No Solution

OR USE Q.F.

4. Given the quadratic equation $(y + 1) = \frac{1}{8}(x + 2)^2$, determine the coordinates of the focus and the equation of the directrix.

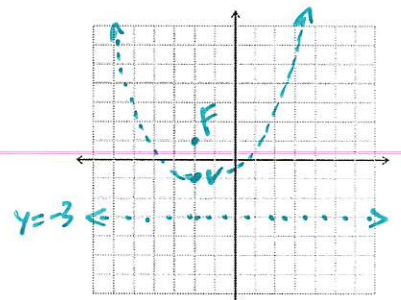
GET INTO $y = \frac{1}{4p}(x-h)^2 + k$

$$y + 1 = \frac{1}{8}(x+2)^2$$

$$y = \frac{1}{8}(x+2)^2 - 1$$

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

So... $p=2$ & vertex is $(-2, -1)$



Focus $(-2, 1)$
DIRECTRIX $y = -3$

5. Solve for x:

$$\begin{aligned}
 x &= 5 + \sqrt{3x - 11} \\
 x - 5 &= \sqrt{3x - 11} \\
 x^2 - 10x + 25 &= 3x - 11 \\
 x^2 - 13x + 36 &= 0 \\
 (x - 9)(x - 4) &= 0 \\
 x = 9 \quad x = 4
 \end{aligned}$$

check

$$\begin{aligned}
 9 &\stackrel{?}{=} 5 + \sqrt{3(9) - 11} \\
 9 &= 9 \checkmark \\
 \hline
 4 &\stackrel{?}{=} 5 + \sqrt{3(4) - 11} \\
 4 &\neq 6
 \end{aligned}$$

$$\{9\}$$

6. Solve for x:

$$\begin{aligned}
 6x^2 - 7x &= -2 \\
 6x^2 - 7x + 2 &= 0 \\
 x &= \frac{-(-7) \pm \sqrt{(-7)^2 - 4(6)(2)}}{2(6)} \\
 x &= \frac{7 \pm \sqrt{1}}{12}
 \end{aligned}$$

$$\begin{aligned}
 x &= \frac{7+1}{12} \quad \& \quad x = \frac{7-1}{12} \\
 x &= \frac{2}{3} \quad \& \quad x = \frac{1}{2}
 \end{aligned}$$

$$\left\{ \frac{1}{2}, \frac{2}{3} \right\}$$

7. Solve for x:

$$\begin{aligned}
 x^4 - 4x^3 + 5x^2 &= 0 \\
 x^2(x^2 - 4x + 5) &= 0 \\
 x^2 = 0 \quad x^2 - 4x + 5 &= 0 \\
 x = 0 \checkmark \quad x &= \frac{4 \pm \sqrt{(-4)^2 - 4(1)(5)}}{2(1)}
 \end{aligned}$$

$$x = \frac{4 \pm \sqrt{-4}}{2} \rightarrow \frac{4 \pm 2i}{2} \rightarrow 2 \pm i \checkmark$$

$$\{0, 2 \pm i\}$$

8. Simplify completely:

$$\begin{aligned}
 (x - 2i)^2 - (3x + 4i)^2 \\
 (x - 2i)(x - 2i) - (3x + 4i)(3x + 4i) \\
 (x^2 - 4xi + 4i^2) - (9x^2 + 24xi + 16i^2) \\
 (x^2 - 4xi - 4) - (9x^2 + 24xi - 16) \\
 x^2 - 4xi - 4 - 9x^2 - 24xi + 16 \\
 \boxed{-8x^2 - 28xi + 12}
 \end{aligned}$$