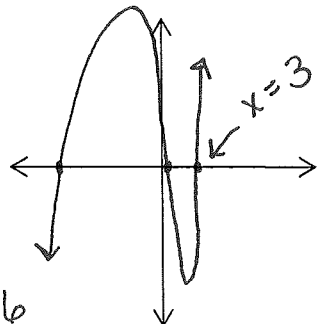


Unit 6 Review & 7.2A Worksheet

Name ANSWER KEY Per

Find the zeros of each polynomial function.

1) $f(x) = x^3 + 5x^2 - 26x + 6$



$$\begin{aligned} x &= 3 \\ x &= -4 + 3\sqrt{2} \\ x &= -4 - 3\sqrt{2} \end{aligned}$$

$$\begin{array}{r|rrrr} 3 & 1 & 5 & -26 & 6 \\ & \downarrow & 3 & 24 & -6 \\ \hline & 1 & 8 & -2 & 0 \end{array}$$

$$f(x) = x^2 + 8x - 2$$

$$\begin{aligned} a &= 1 \\ b &= 8 \\ c &= -2 \end{aligned}$$

$$x = \frac{-(-8) \pm \sqrt{(-8)^2 - 4(1)(-2)}}{2(1)}$$

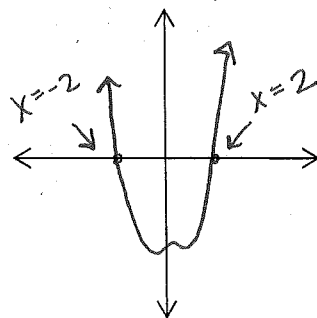
$$x = \frac{-8 \pm \sqrt{72}}{2}$$

$$x = \frac{-8 \pm 6\sqrt{2}}{2}$$

$$x = -4 \pm 3\sqrt{2} \text{ and } 3$$

3) $f(x) = 5x^4 - 13x^2 - 28$

$$\begin{aligned} x &= -2 \\ x &= 2 \\ x &= \frac{i\sqrt{35}}{5} \\ x &= \frac{-i\sqrt{35}}{5} \end{aligned}$$



$$\begin{array}{r|rrrrr} -2 & 5 & 0 & -13 & 0 & -28 \\ & \downarrow & -10 & 20 & -14 & 28 \\ \hline & 5 & -10 & 7 & -14 & 0 \end{array}$$

$$f(x) = 5x^3 - 10x^2 + 7x - 14$$

$$\begin{array}{r|rrrr} 2 & 5 & -10 & 7 & -14 \\ & \downarrow & 10 & 0 & 14 \\ \hline & 5 & 0 & 7 & 0 \end{array}$$

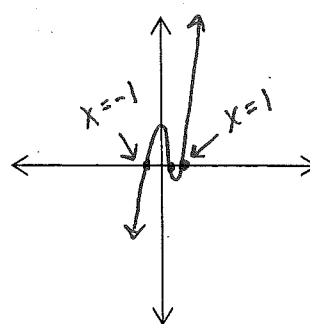
$$f(x) = 5x^2 + 7$$

$$\begin{aligned} a &= 5 \\ b &= 0 \\ c &= 7 \end{aligned}$$

$$x = \frac{-(-0) \pm \sqrt{(-0)^2 - 4(5)(7)}}{2(5)}$$

$$x = \frac{0 \pm \sqrt{-140}}{10} = \frac{0 \pm 2i\sqrt{35}}{10} = \frac{0 \pm i\sqrt{35}}{5}$$

2) $f(x) = 5x^3 - x^2 - 5x + 1$



$$\begin{aligned} x &= -1 \\ x &= 1 \\ x &= \frac{1}{5} \end{aligned}$$

$$\begin{array}{r|rrrr} -1 & 5 & -1 & -5 & 1 \\ & \downarrow & -5 & 6 & -1 \\ \hline & 5 & -6 & 1 & 0 \end{array}$$

$$f(x) = 5x^2 - 6x + 1$$

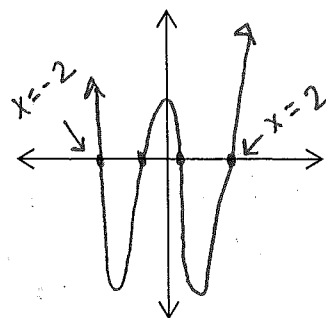
$$\begin{array}{r|rrr} 1 & 5 & -6 & 1 \\ & \downarrow & 5 & -1 \\ \hline & 5 & -1 & 0 \end{array}$$

$$f(x) = 5x - 1$$

$$\begin{aligned} 5x - 1 &= 0 \\ 5x &= 1 \\ x &= \frac{1}{5} \end{aligned}$$

4) $f(x) = 5x^4 - 22x^2 + 8$

$$\begin{aligned} x &= -2 \\ x &= 2 \\ x &= \frac{\sqrt{10}}{5} \\ x &= \frac{-\sqrt{10}}{5} \end{aligned}$$



$$\begin{array}{r|rrrrr} -2 & 5 & 0 & -22 & 0 & 8 \\ & \downarrow & -10 & 20 & 4 & -8 \\ \hline & 5 & -10 & -2 & 4 & 0 \end{array}$$

$$f(x) = 5x^3 - 10x^2 - 2x + 4$$

$$\begin{array}{r|rrrr} 2 & 5 & -10 & -2 & 4 \\ & \downarrow & 10 & 0 & -4 \\ \hline & 5 & 0 & -2 & 0 \end{array}$$

$$f(x) = 5x^2 + 0x - 2$$

$$a = 5, b = 0, c = -2$$

$$x = \frac{-(-0) \pm \sqrt{(-0)^2 - 4(5)(-2)}}{2(5)}$$

$$x = \frac{0 \pm \sqrt{40}}{10} = \frac{0 \pm 2\sqrt{10}}{10} = \frac{0 \pm \sqrt{10}}{5}$$

Simplify each expression.

$$5) -3x^{-4} \cdot 4x^2$$

$$\frac{-3 \cdot 4x^2}{x^4} = \boxed{\frac{-12}{x^2}}$$

$$6) (2d^2)^3$$

$$2^3 d^6$$

$$\boxed{8d^6}$$

$$7) (4^{-1}xy^3)^2$$

$$4^{-2}x^2y^6 = \frac{x^2y^6}{4^2}$$

$$\boxed{\frac{x^2y^6}{16}}$$

$$8) \frac{4x^3}{x^4}$$

$$\frac{4}{x}$$

$$9) (5x^4y)(-x^2y^2)$$

$$\boxed{-5x^6y^3}$$

$$10) (-2x^2y^{-3})^4$$

$$(-2)^4 x^8 y^{-12}$$

$$\boxed{\frac{16x^8}{y^{12}}}$$

$$11) \frac{8x^2y^{-3}}{-2xy}$$

$$\boxed{\frac{-4x}{y^4}}$$

Reduce the fraction 1st:
this seems easier!

$$= (-2x^4y)^{-3}$$

$$= (-2)^{-3} x^{-12} y^{-3}$$

$$= \boxed{\frac{1}{-8x^{12}y^3}}$$

$$12) \left(\frac{-6x^2y^3}{3x^{-2}y^2} \right)^{-3}$$

$$= \frac{(-6)^{-3} x^{-6} y^{-9}}{3^{-3} x^6 y^{-6}}$$

$$= \frac{3^3 y^6}{(-6)^3 x^6 x^6 y^9}$$

$$= \frac{27y^6}{-216x^{12}y^9} = \boxed{\frac{-1}{8x^{12}y^3}}$$

Doing the power 1st:
this is a much longer way!

$$13) -6x^3 \cdot 2x^5y$$

$$\boxed{-12x^8y}$$

$$14) (-7x)^{-3}$$

$$= (-7)^{-3} x^{-3}$$

$$= \frac{1}{(-7)^3 x^3}$$

$$= \boxed{\frac{1}{-343x^3}}$$

$$15) \frac{-8x^6y^{-2}}{12x^{-2}y}$$

$$= \frac{-2x^6x^2}{3yy^2}$$

$$= \boxed{\frac{-2x^8}{3y^3}}$$

$$16) (10xy^0)^2$$

$$(10x)^2$$

$$\boxed{100x^2}$$