

1. Factor each of the following expressions

a) $x^3 - 9x$

b) $x^2 - 4x - 32$

c) $x^3 + 2x^2 - 8x$

2. Solve each of the following equations

a) $x^2 - 4 = 0$

b) $x^2 + 4x - 12 = 0$

c) $x^3 + 3x^2 - 10x = 0$

d) $x^2 - 5 = 2x + 10$

e) $50 - x^2 = 2x + 2$

3. Convert each expression into one using Fraction Exponents

a) $\sqrt{x}$

b) $\sqrt[4]{x}$

c) $\frac{2}{\sqrt{4x+1}}$

d) $\frac{1}{\sqrt[3]{x-5}}$

4. Determine the Domain of each function

a) $f(x) = x^3 + 6x - 2$

b) $g(x) = \sqrt{2x - 10}$

c) $h(x) = \frac{5}{x - 3}$

d) $D(x) = \frac{x + 5}{x^2 - 16}$

5. Name the Vertical and Horizontal Asymptotes of each function

a) $h(x) = \frac{2x + 5}{x - 3}$

b) $D(x) = \frac{x + 5}{x^2 - 16}$

6. Find $f(x + h)$ and then $\frac{f(x + h) - f(x)}{h}$ for each function below:

a) $f(x) = x^2 + 6x$

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

c) $f(x) = \sqrt{x}$

d) $f(x) = \frac{4}{x + 2}$

7. Use the Quadratic Formula to solve each equation. $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

a) $x^2 - 15x + 36 = 0$

b) $x^2 + 4x - 60 = 0$

c) $-x^2 - 8x + 240 = 0$

d) $x^2 - 80x + 1500 = 0$

e) $-0.05x^2 + 4x - 75 = 0$

8. Draw a rough sketch of each pair of functions and also find the x-coordinates where they intersect

a) $y = 8 - x$
 $y = x^2 + x$

b) $y = 16x$
 $y = x^3$