

Use the elimination method to solve the system.

$$\begin{cases}
 x - y - 2z = -4 \\
 -2x + y + 2z = 6 \\
 3x + y + 3z = -6
 \end{cases}$$

$-x = 2 \rightarrow x = -2$
 $-2(-2) + y + 2z = 6 \rightarrow -y + 2z = -2$
 $3(-2) + y + 3z = -6 \rightarrow y + 3z = 0$
 $-2 - (-y) - 2(-2) = -4 \rightarrow -2 + y + 4 = -4 \rightarrow y = -6$
 $z = -2$
 $(-2, -6, -2)$

4. Let $f(x) = 2x - 7$ and $g(x) = 4x - 5$. Find $(f \circ g)(-7)$.

$2 - y = -4 \rightarrow y = 6$

$f(g(-7)) = f(4(-7) - 5) = f(-33) = 2(-33) - 7 = -66 - 7 = -73$

5. Simplify $\sqrt[3]{24a^{10}b^{12}}$. Assume that all variables are positive.

$2a^3b^4\sqrt[3]{3a}$

Use Pascal's Triangle to expand the binomial.

6. $(s - 2v)^5$

$1s^5 \quad 5s^4(-2v) \quad 10s^3(-2v)^2 \quad 10s^2(-2v)^3 \quad 5s(-2v)^4 \quad 1(-2v)^5$
 $s^5 - 10s^4v + 40s^3v^2 - 80s^2v^3 + 80sv^4 - 32v^5$

Find the roots of the polynomial equation.

7. $x^3 - 2x^2 + 10x + 136 = 0$

$\begin{array}{r|rrrrr}
 -4 & 1 & -2 & 10 & 136 & \\
 & & -4 & 24 & -136 & \\
 \hline
 & 1 & -6 & 34 & 0 &
 \end{array}$
 $x^2 - 6x + 34 = 0$
 $x = \frac{6 \pm \sqrt{36 - 136}}{2} = \frac{6 \pm \sqrt{100}}{2} = \frac{6 \pm 10i}{2} = 3 \pm 5i$
 $x = -4, 3 \pm 5i$

8. Divide $2x^3 - 3x^2 - 4x + 4$ by $x + 2$.

$\begin{array}{r}
 2x^3 - 3x^2 - 4x + 4 \\
 \underline{-(2x^2 + 4x + 8)} \\
 2x^3 - 3x^2 - 4x + 4 \\
 \underline{-(2x^3 + 4x^2 + 8x + 16)} \\
 -7x^2 - 12x - 12
 \end{array}$
 $2x^2 - 7x + 10 = \frac{10}{x+2}$
 $2x^2 - 7x + 10 - \frac{10}{x+2}$

9. Write a polynomial function in standard form with zeros at 2, -5, and -1.

$(x - 2)(x + 5)(x + 1)$
 $(x^2 + 3x - 10)(x + 1)$
 $x^3 + x^2 + 3x^2 + 3x - 10x - 10$
 $x^3 + 4x^2 - 7x - 10$

10. Find the zeros of $y = x(x - 5)(x + 2)$. Then graph the equation.

$x = 0, 5, -2$

Use the Quadratic Formula to solve the equation.

11. $-4x^2 - x + 10 = 0$

$x = \frac{1 \pm \sqrt{1 - 4(-4)(10)}}{2(-4)}$
 $= \frac{1 \pm \sqrt{81}}{-8} = \frac{1 \pm 9}{-8} = \left(1, -\frac{5}{4}\right)$

12. Simplify $\sqrt{-216}$ using the imaginary number i .

$6i\sqrt{6}$