1. Find the equation for the line through the points \((-2, 3)\) and \((1, 9)\).

   \[ m = \frac{9 - 3}{1 - (-2)} = \frac{6}{3} = 2 \]

   \[ y = 2(x + 2) + 3 \]

   or

   \[ y = 2x + 7 \]

2. Find the slope of the line \(2x + 3y = 4\).

   \[ 2x + 3y = 4 \]
   \[ 3y = -2x + 4 \]
   \[ y = \frac{-2}{3}x + \frac{4}{3} \]

   \[ m = -\frac{2}{3} \]

3. Simplify: \(\frac{(x^3y^2)^2}{x^4y^3}\) = \(\frac{x^6y^4}{x^4y^3}\) = \(x^2y\)
4. Simplify: \( \frac{\sqrt{x^4 y^2}}{xy^{-2}} = \frac{(x^4 y^2)^{1/2}}{x y^{-2}} = \frac{x^2 y}{x y^{-2}} = \sqrt{x y^3} \)

5. Express the following number in scientific notation: 1,250,000.

\[ 1.25 \times 10^6 \]

6. Compute the following. Express your answer in scientific notation rounded to three digits.

\[(3.4 \times 10^{-4}) \times (5.8 \times 10^8)\]

\[= 19.72 \times 10^4\]

\[= 1.97 \times 10^5\]

7. If \( f(x) = \sin x \) and \( g(x) = 3x + \sqrt{x} \), what is \( f(g(x)) \)?

\[ f(g(x)) = f(3x + \sqrt{x}) = \sin (3x + \sqrt{x}) \]
8. Convert \( \frac{5\pi}{6} \) radians to degrees.

\[
\frac{5\pi}{6} \times \frac{180}{\pi} = 150^\circ
\]

9. Consider the following right triangle:

What is \( \cos \theta \)?

\[
\cos \theta = \frac{\text{adj}}{\text{hyp}} = \frac{8}{17}
\]

10. Consider the following right triangle:

If \( \theta = 35^\circ \), what is \( a \)?

\[
\sin \theta = \frac{a}{c}
\]

\[
\sin (35^\circ) = \frac{a}{c}
\]

\[
a = (6 \sin(35^\circ)) \approx 3.44
\]
1. Find the equation for the line through the points \((-5, 2)\) and \((-5, 4)\).

\[ m = \frac{4 - 2}{-5 + 5} = \frac{2}{0} \text{ undefined, vertical line} \]

The equation for the line is \(x = -5\).

2. Find the \(x\)-intercept of the line \(3x + 4y = 9\).

\[ y = 0 \]
\[ 3x + 4(0) = 9 \]
\[ 3x = 9 \]
\[ x = 3 \]

3. Simplify: \(\frac{x^{1/2}}{x^{1/3}} = x^{\frac{1}{2} - \frac{1}{3}} = \sqrt[6]{x} \) or \(\sqrt[6]{x^\frac{1}{2}}\).

\[ \frac{1}{2} - \frac{1}{3} = \frac{3}{6} - \frac{2}{6} = \frac{1}{6} \]
4. Simplify: \[ \frac{x^3 y}{x^{-1} \sqrt{y}} = \frac{x^{3 \cdot \frac{1}{2}}}{x^{-1} y^{\frac{1}{2}}} = \frac{\sqrt{x} y^{\frac{1}{2}}}{y^{\frac{1}{2}}} = \sqrt{x} \]
   or \[ \frac{\sqrt{x^4}}{y^{\frac{1}{2}}} \]

5. Express the following number in scientific notation: 0.000325
   \[ 3.25 \times 10^{-4} \]

6. Compute the following. Express your answer in scientific notation rounded to three digits.
   \[ \sqrt{2.3 \times 10^{15}} = \left(2.3 \times 10^{15}\right)^{\frac{1}{2}} \]
   \[ = \sqrt{2.3} \times 10^{7\frac{1}{2}} = \sqrt{2.3} \sqrt{10} \times 10^7 \]
   \[ = 4.80 \times 10^7 \]

7. If \( f(x) = \sqrt{x} \) and \( g(x) = x^3 + 2x \), what is \( g(f(x)) \)?
   \[ g(f(x)) = g(\sqrt{x}) = \left(\sqrt{x}\right)^3 + 2\sqrt{x} \]
   \[ = x^{3/2} + 2\sqrt{x} \]
8. Convert $210^\circ$ to radians. Give your answer as a fraction involving $\pi$.

\[
210 \times \frac{\pi}{180} = \frac{7\pi}{6} \text{ radians}
\]

9. Consider the following right triangle:

What is $\tan \theta$?

\[
\tan \theta = \frac{\text{opp}}{\text{adj}} = \frac{5}{12}
\]

10. Consider the following right triangle:

If $\theta = \frac{\pi}{3}$ radians, what is $a$?

\[
\cos \theta = \frac{a}{5}
\]

\[
\cos \left(\frac{\pi}{3}\right) = \frac{a}{5}
\]

\[
a = 5 \cos \left(\frac{\pi}{3}\right) = 2.5
\]