1. Graph the line.

\[ y = -\frac{1}{4}x + 5 \]

2. Find the slope and the \( y \)-intercept of the line.

\[ 7x - 2y = -2 \]

Write your answers in simplest form.
3. Consider the line \( y = \frac{3}{4}x + 7 \)

(a) Find the equation of the line that is parallel to this line and passes through the point \((-8, 5)\)

(b) Find the equation of the line that is perpendicular to this line and passes through the point \((-8, 5)\)

4. Consider the line \( y = -\frac{5}{3}x + 5 \)

(a) Find the equation of the line that is perpendicular to this line and passes through the point \((-5, -4)\)

(b) Find the equation of the line that is parallel to this line and passes through the point \((-5, -4)\)

5. A motorboat takes 3 hours to travel 144 km going upstream. The return trip takes 2 hours going downstream. What is the rate of the boat in still water and what is the rate of the current?

   Rate of the boat in still water: [ ] km/h
   Rate of the current: [ ] km/h

6. Jose bought a desktop computer and a laptop computer. Before finance charges, the laptop cost $450 less than the desktop. He paid for the computers using two different financing plans. For the desktop the interest rate was 6.5% per year, and for the laptop it was 9% per year. The total finance charges for one year were $409. How much did each computer cost before finance charges?

7. Simplify.

\[
\left(-2x^2y^2 z^4\right)\left(-2x^3y^3 z\right)^2
\]
8. Simplify.

\[
(-2a^4b^{-6})^2
\]

Write your answer using only positive exponents.

9. Write 0.000373 in scientific notation.

10. Multiply.

\[
(y + 1)(y - 6)
\]

Simplify your answer.

11. Divide.

\[
\left(-15 \sqrt[4]{x^2} + 4 \sqrt[3]{x}\right) \div \left(-2 \sqrt[4]{x^2}\right)
\]

Simplify your answer as much as possible.

12. Divide.

\[
\frac{11x - 6x^3 + 3 - 15x^4 - 4x^2}{-3x^2 + 1}
\]

Write your answer in the following form: Quotient + \[
\frac{\text{Remainder}}{-3x^2 + 1}
\]

\[
\frac{11x - 6x^3 + 3 - 15x^4 - 4x^2}{-3x^2 + 1} = \frac{\square}{\square} + \frac{\square}{-3x^2 + 1}
\]
13. Factor \( 9y^7 - 15y^3 \)

14. Factor by grouping.

\[ uy - 14u + 7u^2 - 2y \]

15. Solve for \( x \) in the equation below.

Round your answer to the nearest hundredth.

Do not round any intermediate computations.

\[ 12^{x+9} = 7 \]

16. Solve for \( x \)

\[ 2^{x^2 + 18x - 18} = 32^{3x - 4} \]

17. Fill in the missing values to make the equations true.

(a) \( \log_2 5 + \log_2 7 = \log_2 \) \[ \square \]

(b) \( \log_7 \) \[ \square \] - \( \log_7 11 \) = \( \log_7 \) \[ \frac{3}{\square} \]

(c) \( \log_3 8 \) \[ \square \] = \( \square \) \( \log_3 3 \)
18. Consider the equation

\[ \log_4 14^{x+3} = 3 \]

Find the value of \( x \) Round your answer to 3 decimal places.

19. Evaluate.

\[ \log_3 81 \]

20. Solve for \( x \)

\[ \log_8 x = -2 \]

Simplify your answer as much as possible.
21. Graph the parabola.
\[ y = (x - 1)^2 - 3 \]

22. Solve \((y + 6)^2 - 72 = 0\) where \(y\) is a real number. Simplify your answer as much as possible.

23. Rationalize the denominator and simplify.
\[ \frac{\sqrt{11} - \sqrt{3}}{\sqrt{11} + \sqrt{3}} \]

24. Solve for \(u\) where \(u\) is a real number.
\[ \sqrt{40 - 6u} = u - 4 \]
25. For the following right triangle, find the side length \( x \). Round your answer to the nearest hundredth.

\[
\begin{array}{c}
\text{x} \\
\text{18} \\
\text{11}
\end{array}
\]

26. Write the following expression in simplified radical form.

\[
\sqrt[3]{32x^9w^{12}}
\]

Assume that all of the variables in the expression represent positive real numbers.

27. How many machines will be needed to complete a task in 9 days, given that 6 machines can complete the same task in 6 days?