

Math 105 Exam #3

Perform the indicated division. $\frac{x^5 - x^4 - x^2 - x}{x^3 + x}$

Find all solutions to the equation $6x^3 = 15x - x^2$.

Factor completely $3x^4y^2 - 48$.

A rectangle has a side that is one unit longer than twice the other side and its area is one unit more than its perimeter. Write an equation and solve it to find the small side of the rectangle.

Solve the formula $T = \frac{2B + E}{B + E}$ for the variable E .

Find all solutions to the equation $\frac{2x^2 - 4}{x^2 - 4} - \frac{1}{x - 2} = 1$.

Perform the operations and simplify $\frac{-15}{x^2 + 5x - 50} + \frac{1}{x - 5} - \frac{1}{x}$.

Simplify $\frac{3x^{-2} + y}{2x^{-3} + y}$ and write the result without negative exponents.

For the function $f(x) = \frac{1}{x} - 3x$, find all values of a so that $f(a + 1) = -2$.

Write an equation that can be used to solve the work problem. Then answer the question asked. Naomi Ericson and Tyrone Stokes work for a computer software company. Together they can write a particular type of computer program in 16 hours. Naomi can write the program by herself in 32.93 hours. How long will it take Tyrone to write the program alone?

11. Write the variation and find the quantity indicated. P varies directly with a and inversely with the square of b . If $P = 2$ when $a = 5$ and $b = 5$, find P when $a = 10$ and $b = 12$. Round your answer to the nearest hundredth when necessary.

Simplify: $\frac{2x^4 + 4x^2}{6x^2 + 14x + 4} \div \frac{x^2 + 2}{3x^2 + x}$

Simplify: $\frac{x^2 + 4x - 5}{2x^2 + x - 3} \cdot \frac{2x + 3}{x^2 + 4x + 3} + \frac{1}{x^2 + 5x + 6}$

Let $f(x) = \frac{4}{x - 1}$.

Find and simplify $\frac{f(x + h) - f(x)}{h}$

Solve the equation for w : $\frac{2}{w - 5} = \frac{22}{2w^2 - 9w - 5} - \frac{3}{2w + 1}$

Let $f(x) = 3x^3 - 3x^2$ and $g(x) = 3x^2 + 45x$. Solve the following equation for x :

$$f(x) = g(x)$$

The gravitational force F between two planets varies jointly as their masses M_1 and M_2 and inversely as the square of the distance d between them. If the distance d is tripled, then how will it affect F ?

Let $f(x)$ be a function. Solve the following equation for $f(x)$:

$$(2x + 3)f(x) + 5f(x) = 4$$

Simplify the following without using negative exponents:

$$(x + y)(x^{-1} + y^{-1})^{-1}$$

A swimming pool has two inlet pipes that fill the pool. It takes twice as long for one of the pipes to fill the pool, as it does for the other pipe to fill the pool. If both pipes are left open then it takes 8 hours to fill the pool. How long does it take for each pipe to fill the pool separately?

In a 30 mile bike race, Ginny finished a half hour ahead of Matt. If Ginny's average speed was 2 miles per hour faster than Matt's, then find Ginny's average speed.

Let $g(x) = x^3 - 7x + 6$. Factor $g(x)$ completely by using the fact that $x - 2$ is one of its factors.

Simplify: $\frac{x^2 + 5x - 6}{3x + 3} \div \frac{2x + 12}{3x^2 - 3}$

Simplify: $\frac{3x^2 - x - 14}{x^2 + 3x + 2} \cdot \left(\frac{2x + 1}{3x - 7} + \frac{x}{7 - 3x} \right)$

Simplify: $(x + y)(x^{-1} + y^{-1})^{-1}$

Let $f(x) = \frac{1}{x-2}$ and $g(x) = \frac{1}{x+2}$.

Find $\frac{f(x+h) - f(x)}{h}$.

Solve the equation $f(x) + g(x) = \frac{4}{x^2 - 4}$ for x .

Solve the following equation for x :

$$2x^3 + 30x = 16x^2$$

If it takes 6 people 5 hours to mow a golf course, then how long would it take 10 people to mow the same golf course?

Solve the following equation for A :

$$\frac{1}{A} + \frac{1}{B} = \frac{1}{C}$$

Let $f(x) = x^4 - x^3 - 11x^2 + 9x + 18$. Factor $f(x)$ completely by using the fact that $x - 2$ is one of its factors.

A small plane and a car leave from Anchorage at the same time. Both are heading towards Whitehorse which is 450 miles away. The speed of the plane is 3 times the speed of the car. The plane arrives in Whitehorse 6 hours before the car. Find the speed of the plane and the car.