

Math 107 Exam #2

Find all real solutions to the equation. Give exact solutions and decimal approximations to four decimal places.

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

Find all real solutions of the equation. Give exact solutions and decimal approximations to three decimal places.

$$\sqrt[5]{x^8} - 2\sqrt[5]{x^4} - 1 = 0$$

Find all real solutions of the equation. Give exact solutions.

$$\sqrt{2x - \sqrt{3x}} = \sqrt{3}$$

Find all real solutions for the equation. Give exact solutions.

$$3|(x - 1)^5| + 4 = 100$$

Find all points on the graph of $x - 3y = 6$ that are 6 units away from the origin.

One ferry travels twice the speed of another ferry. The slower ferry leaves port A at 2:00pm and the faster ferry leaves port B at 3:00pm. Suppose that ports A and B are 130 miles apart and that the ferries are traveling toward each other. If the ferries meet at 50 miles from port A, what time do they meet?

Suppose that we have 150 ml of a 12% acid solution and 250 ml of a 20% acid solution. If we wish to add a certain amount of acid to the 12% solution and an equal amount of water to the 20% solution so that each resulting solution will have the same concentration of acid, how much acid should be added to the 12% solution and how much water should be added to the 20% solution? Give the solution as an exact value and as a decimal to four decimal places.

Solve the inequality and write your answer using interval notation.

$$-3 \frac{4 + 2x}{-4} + 5 < 11$$

Solve the inequality and write your answer using interval notation.

$$7 - \frac{1}{2}|3x + 1| < 5$$

Solve the inequality and write your answer using interval notation.

$$\frac{2}{x^2 - 4} > \frac{1}{x + 2} - 1$$

Solve $x + 6 = \frac{3}{x}$.

Solve $6x^5 = 42x^3 + 48x$

The surface temperature of the moon varies approximately over the interval $-173^\circ \leq C \leq 127^\circ$ on the Celsius scale. What is the corresponding interval on the Fahrenheit scale? Round your answer to the nearest $1^\circ F$.

Solve $1 + \frac{2}{x+1} \geq \frac{2}{x}$. Specify the answer using interval notation.

Solve $\sqrt{x+4} - \sqrt{x-5} + 3 = 0$.

Solve $\left| \frac{4-5x}{2} \right| > 1$. Specify the answer using interval notation.

Solve $3x^3 < x - 2x^2$. Specify the answer using interval notation.

A piece of wire 8 inches long is bent to form a right triangle in which the length of the shortest side is half that of the hypotenuse. Find the length of the hypotenuse. Round your answer to two decimal places.

How much salt must be added to a 5 % salt solution (percentages are by weight) to get 30 gms. of a 12 % salt solution? Round your answer to two decimal places.

Find two positive integers that satisfy the condition : When three times the smaller of two integers is added to the larger, the sum is 30. The sum of the squares of these two integers is 130.

Solve $x - 6 = \frac{2}{x}$

Solve $6x^4 = 42x^3 + 48$

Solve $\left| \frac{2-3x}{2} - 1 \right| \leq 1$. Specify the answer using interval notation.

Solve $\frac{2}{x} - \frac{2}{x+1} \leq 1$. Specify the answer using interval notation.

Solve $\sqrt{x+4} + 3 = \sqrt{x-5}$.

Solve $\left| \frac{3(2-x)}{2} - \frac{2(1+x)}{3} \right| > 1$. Specify the answer using interval notation.

Solve $x^3 + 2x^2 < 3x$. Specify the answer using interval notation.

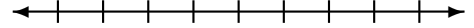
The height, h , of a triangle is half the length of its base, b . If the height of the triangle is tripled and the length of the base is doubled, by what factor will the area, A , of the triangle change?

How much water must be added to a 12 % salt solution (percentages are by volume) to get 300 cm^3 . of a 5 % salt solution? Round your answer to two decimal places.

The point (a, b) lies on the line $2x + y = 1$ in the rectangular plane. Find a if the distance between (a, b) and the origin is 1.

Solve for x (give exact answer, no decimals!) : $x + 6 = \frac{3}{x}$

Solve and graph on the number line: $\left| \frac{2 - 3x}{5} \right| < 2$



Solve the inequality (give answer using interval notation): $x^3 - 2x^2 < 15x$

The base of a triangle is double the height. If both of these are increased by 4 ft then the area is increased by 68 ft². Find the area of the original triangle.

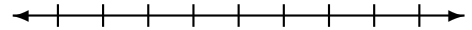
Solve for x : $x^{\frac{4}{3}} + 3x^{\frac{2}{3}} - 28 = 0$

How much pure acid should be added to 5 gallons of a 40% acid solution to increase its strength to 50% acid?

Solve for x : $\sqrt{x + 2} - x = -4$

Solve the inequality (give answer using interval notation): $x - \frac{5}{x} \leq 4$

Solve and graph on the number line: $\left| \frac{3(x-2)}{2} + 4x + 1 \right| \geq 7$



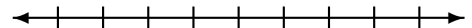
The point (a, b) lies in the first quadrant on the graph of the line $y = x + 1$. Find a and b given that the distance from (a, b) to the origin is $\sqrt{61}$.

Solve and graph on the number line: $1 \leq \frac{2-x}{4} + 3 \leq 5$



Solve for x : $\frac{x}{x+2} + \frac{x}{x-2} = \frac{8}{x^2-4}$

Solve and graph on the number line: $\frac{|2-3x|}{2} + 5 > 7$



Find all the points on the line $y = -x + 3$ whose distance to the origin is $\sqrt{17}$.

Solve for x : $x^4 + 6x^2 - 10 = 0$

A car holds 8 quarts of 60% antifreeze. How much should be drained and replaced with pure antifreeze to obtain 8 quarts of 90% antifreeze?

Solve for x : $\frac{1 + \sqrt{x}}{\sqrt{x + 27}} = 1$

Solve the inequality (give answer using interval notation): $x - \frac{5}{x} \leq 4$

Trey drives from Spokane to Missoula in 3 hours (at constant speed). The traffic is heavier on the return trip, so his speed is 16 mph less. If the return trip takes 4 hours, then what were his speeds on both parts of the trip?