

Math 107 Exam #1

For $5 < x < 10$ write the expression $|x - 12| - |x - 4|$ without absolute values.

Simplify as much as possible. Write your answer as a single fraction with no negative exponents.

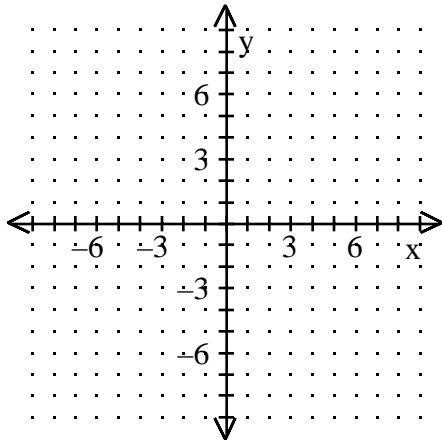
$$\frac{(x^{-1} + y^{-1})^2}{(x^{-2} + y^{-2})}$$

Factor $25x^3y - 4xy^3 + 5x^2y + 2xy^2$ completely.

Find all real solutions of $\frac{-2x}{4-x^2} + 1 = \frac{1}{x-2}$

Solve the equation $\frac{ax+b}{cx-b} = \frac{d}{e}$ for the variable b .

Draw the graph of $y = \begin{cases} -2x & \text{if } -4 < x < -1 \\ -|x| & \text{if } 0 < x < 3 \\ x & \text{if } 4 < x < 8 \end{cases}$



Find all values of k so that the point $(-4,5)$ is on the graph of $y = 2(x+k)^2 - 3$.

Find the equation of the line that is perpendicular to the line $2x - 3y = 5$ and has the same y-intercept as the line $2x - 3y = 5$.

Find the slope of the line through $(-2, 1)$ and the highest point on the circle $x^2 + y^2 - 6x + 2y - 6 = 0$.

Find the perimeter of the triangle bounded by the y-axis and the lines $2x + y = 3$ and $4x - y = 6$.

Find the point P on the curve $y = \frac{1}{x}$ so that the line through P and $(1,1)$ has slope $-1/4$.

Simplify without using absolute value: $|x - 5| + |10 - x|$ where $x > 10$.

Find t so that the slope of the line through $(3, -5)$ and $(5, t)$ is 6.

Simplify: $(x^{-1} + y)(xy^{-1} + x^2)^{-1}$

Find the perimeter of the triangle formed by the x -axis, y -axis and the line passing through $(2, 6)$ and $(4, 2)$.

Solve for x : $x(x - b) = c$

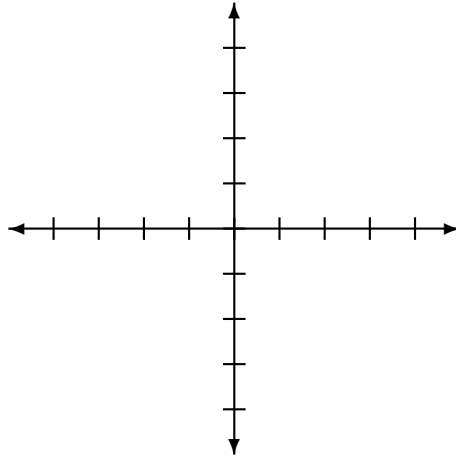
Find a point P on the curve $y = \sqrt{x}$ such that the slope of the line through P and $(1, 1)$ is $\frac{1}{4}$.

Solve for x : $\frac{4}{x^2 - 4x} - \frac{x - 3}{x - 4} = \frac{1}{x}$

Find the x -intercept(s) of the circle with center $(4, 2)$ and tangent to the y -axis.

Rewrite the following using one radical: $\frac{\sqrt{\sqrt{A}\sqrt[3]{A}}}{\sqrt[4]{A}}$

Sketch the graph of the following function on the axis provided. $f(x) = \begin{cases} 2x + 1 & \text{if } x < 0 \\ -\sqrt{x} & \text{if } x \geq 0 \end{cases}$



Find the equation of the line that is perpendicular to $2x + 3y = 6$ and has the same y -intercept.

Solve for x : $x^{5/2} - 4x^{1/2} = 0$

Find k so that the graph of $y = k\sqrt[3]{x-3} - 5$ passes through the point $(11, 3)$.

Simplify: $(y^2x^{-1} + x)(x - y^4x^{-3})^{-1}$

Find the perimeter of the triangle formed by the x -axis, y -axis and the line with slope -3 passing through $(2, 3)$.

Solve for B : $\frac{A}{B} + \frac{C}{5} = D$

Find the point(s) P on the curve $y = x^2$ such that the second coordinate of the midpoint between P and $(1, 1)$ is 5 .

Solve for x : $\frac{x^2}{x^2 - 1} = \frac{4}{x + 1} + \frac{1}{x^2 - 1}$

Find the equation of the line that passes through the point $(3, 7)$ and the y -intercept of the circle $x^2 - 6x + y^2 + 4y + 4 = 0$.

Simplify without using absolute value: $|x - 7| + |3 - x|$ where $3 < x < 7$.

Rewrite $\sqrt[3]{A^2}\sqrt{A^3}$ using a single radical.

Factor $a^2 + 2ab + b^2 + a + b$

Find k if the graph of $y = k(x + 1)^2 + 2$ passes through the point $(1, 4)$.

Find all real solutions of the equation $\frac{4}{x^2 - 4x} - \frac{x - 3}{x - 4} = \frac{1}{x}$.

Solve the equation $a^2 + ax = b^2 - bx$ for x in terms of a and b if $a \neq -b$.

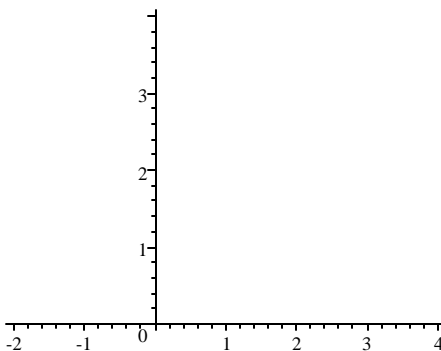
Simplify the expression $\frac{(x^{-1} - y^{-1})^{-1}}{(x - y)^{-1}}$

A line passes through the points $(1, 2)$ and $(3, -5)$. What is the area of the triangle formed by this line and the coordinate axes?

Sketch the graph of the piecewise defined equation

$$y = \begin{cases} -x + 2 & \text{if } x \leq 1 \\ \sqrt{x} & \text{if } x > 1 \end{cases}$$

on the given axes .



Find the equation of the circle with center $(3, -2)$ and which passes through the point $(2, 1)$.

Simplify $|x - 5| + |10 - x|$ if $x < 5$.

Find the equation of the line that is tangent to the circle $x^2 + y^2 = 5$ at the point $(1, 2)$. *{Hint: The radius of a circle is perpendicular to the tangent line}*

Find k if the graph of $y = 2(x + 1)^2 + k$ passes through the point $(1, 4)$.

Solve the equation $x^{\frac{5}{2}} - 9x^{\frac{1}{2}} = 0$ for x

Find the equation of the line that is perpendicular to the line $y = -2x + 3$, and also has the same y -intercept as this line.

Find the point $P = (x, y)$ on the the graph of the equation $y = 2x - 3$ such that the slope of the line through P and the point $(0, 1)$ is -1 .

Find all real solutions of the equation $\frac{2}{2x^2 + 3x + 1} + \frac{4}{x + 1} = \frac{3}{2x + 1}$

Solve the equation $\frac{1}{ax} = \frac{1}{bx} + \frac{1}{c}$ for x in terms of the other letters.

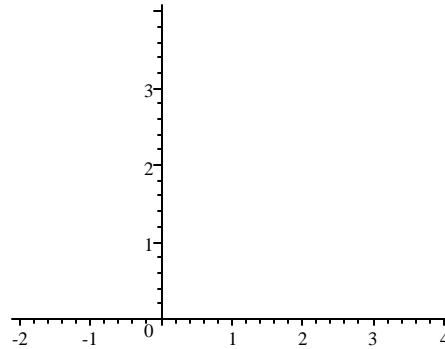
Simplify the expression $\frac{x^{-1} + y^{-1}}{(x^{-1} + y^{-1})^{-1}}$

A line passes through the points $(-3, 8)$ and $(6, -4)$. What is the perimeter of the triangle formed by this line and the coordinate axes?

Sketch the graph of the piece-wise defined equation

$$y = \begin{cases} 1 & \text{if } x \leq -2 \\ -x + 2 & \text{if } -2 < x \leq 1 \\ \sqrt{x} & \text{if } 1 < x \leq 4 \end{cases}$$

on the given axes .



Find the equation of the circle with center $(1, -2)$ and which passes through the point $(2, 1)$.

Simplify $|x - 5| + |10 - x|$ if $x > 10$.