

Show all your work for full credit. Unsupported answers = reduced points. Please use a pencil and clearly identify all answers in the space provided.

1. Simplify the expressions. Write answers with no negative exponents.

a) $(-3x^{-3}y^2)^{-2}(2x^{-2}y)^3$

[/4]

b) $2x^{3/2}\left(\frac{9x^2y^{-2}}{x^{-2}y}\right)^{-1/2}$

[/4]

2. Completely factor and simplify the expression. Write answers with no negative exponents.

a) $36x^{-1/2}y - 12x^{1/2}y + x^{3/2}y$

[/4]

b) $5(2x+5)^4(2)(x-4)^{-2} + (2x+5)^5(-2)(x-4)^{-3}$

[/4]

3. Simplify the expression: $\frac{6}{x^2+x-2} - \frac{x}{x+2}$ and give the restrictions for x .

[/5]

4. Find all real solutions to the equation: $3x^2 - 4x = x^2 + 3$. Write answers in exact form and rounded to 4 decimal places.

[/5]

5. Find all real solutions to the equation: $2x + \sqrt{x-2} = 7$

[/5]

6. Use a sign diagram to solve the inequality. Use interval notation for the answer.

$$(x-2)^2(x^2-16) \geq 0$$

[/5]

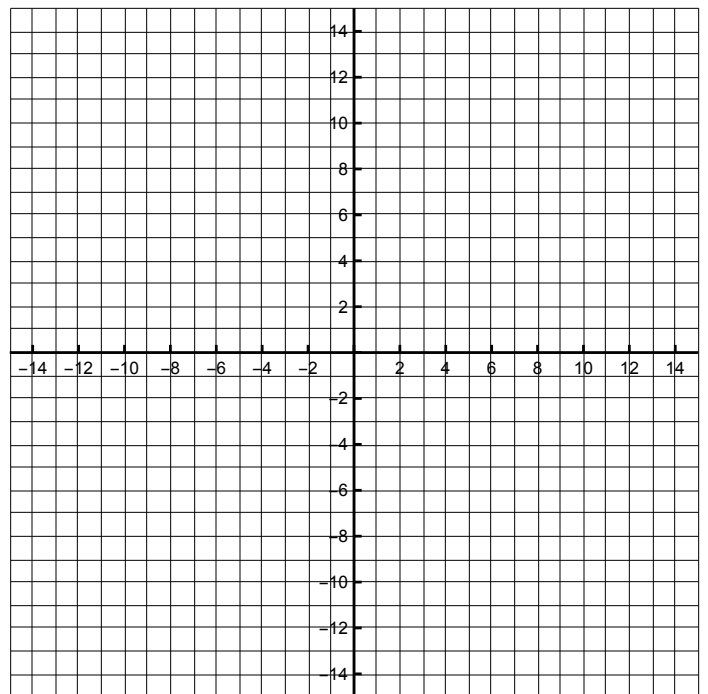
7. A box without a top is to be constructed from a rectangular sheet of metal by cutting 2-inch squares from each corner and folding up the sides. If the sheet metal has length 5 inches longer than the width, find the dimensions of the sheet metal if the box is to have a volume of 100 cubic inches.

[/5]

8. Find the equation of the circle whose diameter has endpoints $(3, 6)$ and $(-7, 4)$.

[/5]

9. Find the center and radius of the circle given by $x^2 + y^2 - 12x + 8y + 27 = 0$. Graph the circle and find the x and y intercepts.



[/6]