

Name: _____

Directions: Complete all question and **show all applicable work.** Partial credit will be given. All questions are equally weighted.

1.) Write the following using interval notation: *The set of all real numbers less than or equal to -4 and greater than 3.*

2.) A rancher has 1600 feet of fencing that will fence off a rectangular grazing pen for cattle. One edge of the pen borders a straight river and needs no fence. Assuming that th edges of the pen perpendicular to the river are x feet long, write a completely factored polynomial whose values give the area of the pen.

3.) Given a right triangle with a leg of length 8 centimeters and hypotenuse of length 17 centimeters, what is the length of the other leg?

4.) Simplify: $\frac{3x^{\frac{2}{6}}}{6x^{\frac{2}{3}}}$

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5.) Solve for x :

$$\frac{2x + 1}{9} - \frac{x + 4}{6} = 1$$

6.) Solve for x :

$$\frac{1}{x} + \frac{1}{3} = 4$$

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7.) Solve the following equation for x :

$$x^2 - 2x = -2$$

8.) Find all the roots (aka zeros) of the following function and tell the multiplicity of each:

$$f(x) = 4(x - 1)^2(x + 2)(x - 6)$$

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9.) Find the vertex, y-intercept and x-intercept(s) of the following function, then graph it.

$$y = (x - 3)^2 - 4$$

10.) Divide the polynomial $x^4 - 3x^3 + 2x^2 + 4x + 5$ by the term $x - 2$.