MAT 1275 HOT Topics

closes 08/31/2023

Problem 1 (1 point)

Factor the expression $2z^2+12z-14$. Simplify your answer as much as possible, but do not combine like factors.

Problem 2 (1 point)

List the roots of the parabola: $y = -8x^2 + 13x - 2$

In other words, list the solutions of the equation: $0 = -8x^2 + 13x - 2$

Problem 3 (1 point)

Evaluate: $\left(\frac{-4^3}{-2^3}\right)^2 =$ _____

Problem 4 (1 point)

Solve the equation.
If there are no solutions, write 'none'.

$$\sqrt{2x+59} - 2 = 5$$

Problem 5 (1 point)

Solve the following system of equations.

$x^2 - 3y^2 = -23$

$x^2 + 3y^2 = 31$

Problem 6 (1 point)

A ramp is set up from a truck's trunk to the ground. The ramp's end at the edge of the trunk is 3.3 ft high. If the angle between the ramp and the ground is 17 degrees, find the length of the ramp.

Round your answer to two decimal places if needed.

The length of the ramp is _____.

Problem 7 (1 point)

Solve the exponential equation by using the property that $b^x = b^y$ means that $x = y$ whenever $b > 0$ and $b \neq 1$.

$$2^{3x-3} = 32$$

Problem 8 (1 point)

Evaluate this expression:

$4[15 - 3(3 + 8)] =$ ___

Problem 9 (1 point)

Perform the indicated operation, and simplify if possible. Assume any factors you cancel are not zero.

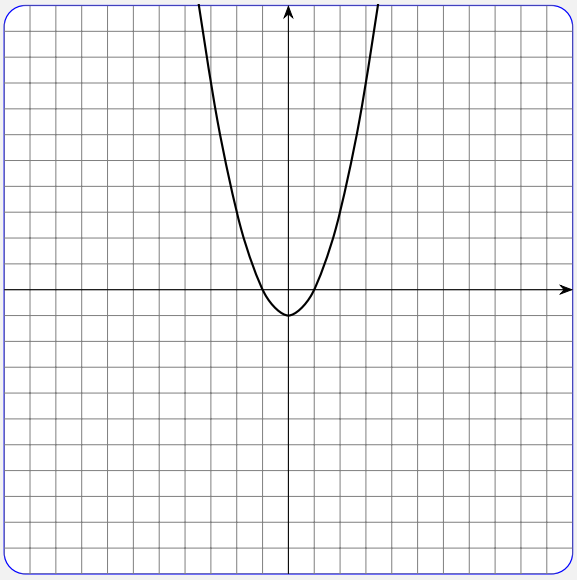
$$\frac{3s-9}{8s-32} \div \frac{s^2-6s+9}{s^2-8s+16}$$

Problem 10 (1 point)

Add or subtract the radical expression, if possible.
Do not use rational exponents in your answer.

$$4p\sqrt{12p^2} + 3p^2\sqrt{48}$$

Problem 11 (1 point)



Consider the graph of an equation $y = ax^2+bx+c$.

Mark each of the following statements as true or false.

(a)There is a solution for which $y = 2$: ___

(b) There is exactly one solution for which $x = \sqrt{5}$: ___

(c) The value of c is 0: ___

(d) The value of a is negative: ___

(e) The system

$y = ax^2 + bx + c$

$y = 5$

has exactly two solutions: ___

HOT Topic Standards

1. Evaluate an expression using order of operations (may include fractions but no exponents)
2. Evaluate an expression using order of operations (may include integer exponents)
3. Factor a quadratic expression
4. Simplify a rational expression using exponents
5. Simplify a radical expression
6. Solve a quadratic equation
7. Solve a rational or radical equation
8. Sketch and label or interpret the graph of quadratic equation
9. Solve a system of equations
10. Use trigonometry in a real-world application
11. Solve an exponential equation or evaluate a logarithm

Six-point Problem-Solving

1. **Context:** What is the problem about?
2. **Observations:** List as many observations as possible (at least three). Include key words and symbols.
3. **Questions:** Write down (at least three) questions you can ask about the problem. Be sure to include any questions you have relating to the observations you have made. Be as specific as possible (for example, "How do I solve this problem?" is not a specific enough question).
4. **Strategies:** Write down the plan or action strategy.
5. **Concepts:** Write down concepts needed to understand and solve the problem.
6. **Conclusions:** Use complete sentences to express the conclusion. (This is where your full solution goes; your solution is the "conclusion" of the six-point process.)

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