

NAME: _____

Student id: _____

INSTRUCTIONS: No books, notes, calculators, etc. All answers must be simplified as much as possible. Write all answers in the spaces provided at the right. Do scratchwork on the back or on scratch paper provided. *No partial credit.* Time: 20 minutes.

1. Simplify the following expression as much as possible. If no simplification is possible, write “not possible”:

$$\frac{e^{2y} + 3}{e^{2y} + 6}$$

Answer: _____

2. Multiply out: $(q^2 + 2q - 4)(q - 2)$.

Answer: _____

3. Let $f(x) = 3 - x$. Evaluate the expression $f(2 - x) - f(7x)$, and simplify it as much as possible.

Answer: _____

4. Find all real solutions to the equation $\ln(2 - 3x) = 3$. If no real solution exists, write “no solution”.

Answer: _____

5. Find all real solutions to the equation $\frac{7x}{x^2 + 10} = -1$. If no real solution exists, write “no solution”.

Answer: _____

6. Write as a single fraction, and simplify as much as possible:

$$\frac{3}{y + 6} - \frac{1}{y + 3}$$

Answer: _____

7. Simplify completely (for $y > 0$):

$$\frac{\left(\frac{2}{9\sqrt{y}}\right)}{\left(\frac{y^{3/2}}{6}\right)}$$

Answer: _____

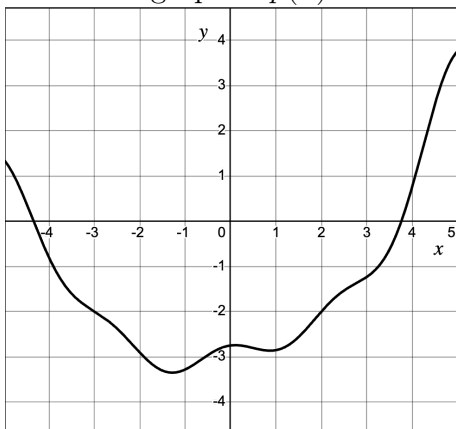
8. Find all real solutions to the equation $5\left(\frac{1}{x^2} - 3\right) = -15$. If no real solution exists, write “no solution”.

Answer: _____

9. Find all real numbers c such that $(-c, 17)$ is in the first quadrant (and not on any of the coordinate axes).

Answer: _____

10. The graph of a function $y = p(x)$ is sketched below (at the left). For which values of x shown on the graph is $p(x) < -2$?



Answer: _____