

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: 30 minutes.

1. Simplify the following expression as much as possible. If no simplification is possible, write “not possible”:
$$\frac{e^{3y} + 3}{e^{3y} + 6}$$

Answer: _____

2. Multiply out: $(2q - 3)(4q - 1)$.

Answer: _____

3. Let $f(x) = 3 - x$. Evaluate the expression $f(2 - x) - f(4x)$, and simplify it as much as possible.

Answer: _____

4. Suppose $q(x) = 2x^3 + 3x^2 - 200$. Find the exact value of $q(10)$.

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. Assuming $x > 0$, write the expression $\frac{7}{3\sqrt[3]{x}}$ as a numerical constant (possibly a fraction) multiplied by a power of x . (x may not appear in a denominator.)

Answer: _____

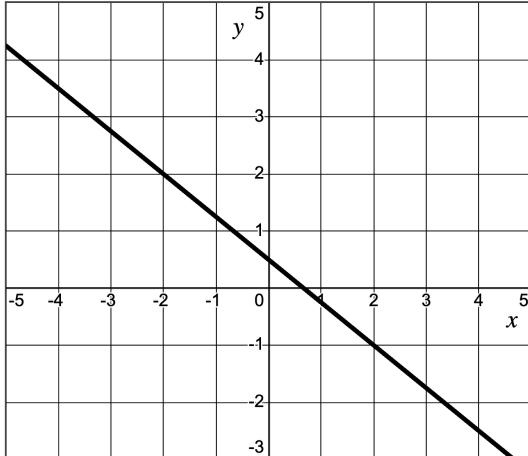
8. Find all real solutions to the equation $5\left(\frac{1}{x^2} - 3\right) = -15$. If no real solution exists, write “no solution”.

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. Determine the exact value of the **slope** of the line in the graph below.



Answer: _____