

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: \_\_\_\_\_

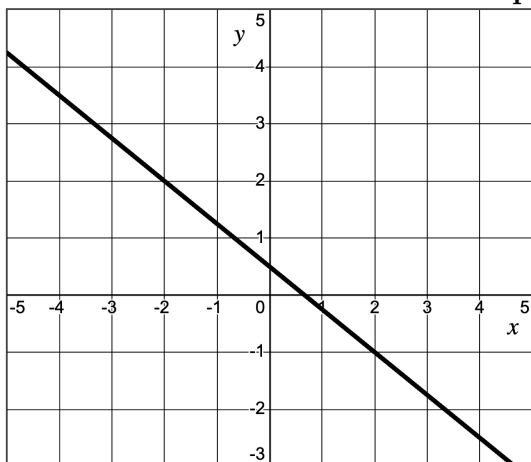
8. Find all real solutions to the equation  $5\left(\frac{1}{x^2} - 3\right) = -15$ . If no real solution exists, write “no solution”.

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: \_\_\_\_\_