

Please show **all** your work for the short answer questions! Answers without supporting work will not be given full credit. Each multiple choice question is worth 2 points. Answer on the provided response sheet.

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Name: _____

1. For which value of x is the expression $\frac{x+4}{x-3}$ undefined?

A. -4
B. -3
C. 3
D. 0

2. Simplify $\frac{9x^4 - 27x^6}{3x^3}$

A. $3x(1 - 3x)$
B. $3x(1 - 3x^2)$
C. $3x(1 - 9x^5)$
D. $9x^3(1 - x)$

3. Simplify $\frac{2x^2 - 12x}{x - 6}$

A. 0
B. $2x$
C. $4x$
D. $2x + 2$

4. Add and simplify $\frac{3}{2x} + \frac{4}{3x}$

A. $\frac{12}{6x^2}$ B. $\frac{17}{6x}$
C. $\frac{7}{5x}$ D. $\frac{17}{12x}$

5. Subtract and simplify $\frac{3x^2}{x-2} - \frac{x^2}{x-2}$

A. undefined B. $\frac{4x^2}{x-2}$
C. $\frac{2x^2}{(x-2)^2}$ D. $\frac{2x^2}{x-2}$

6. Multiply and simplify $\frac{4x}{x-1} \times \frac{x^2-1}{3x+3}$

A. $\frac{4x}{3}$

B. $\frac{4x^2}{3}$

C. $\frac{4x^2}{3(x+1)}$

D. $\frac{4(x+1)}{3}$

7. Divide and simplify $\frac{\frac{x}{x+4}}{\frac{2x}{x^2-16}}$

A. $\frac{2}{x-4}$

B. $\frac{2x^2}{x-4}$

C. $\frac{2x^2}{x^2-16}$

D. $\frac{x-4}{2}$

8. Which of the following is one of the solutions for x . $\frac{5}{x} = \frac{x+13}{6}$

A. -2

B. -3

C. -10

D. -15

9. Solve for x . $\frac{2}{x} - 3 = \frac{26}{x}$

A. -8

B. -1/8

C. 1/8

D. 8

10. Solve for x . $\frac{x+2}{x-2} = -\frac{3}{x}$

A. -2, 3

B. -3, -2

C. -1, 6

D. -6, 1

11. (8 points) Simplify the following and state all restrictions:

(a) $\frac{9x^2 - 6x + 1}{12x^2 - 13x + 3}$

(b) $\frac{6x}{x^2 - 8x + 16} - \frac{2}{x - 4}$

12. (4 points) Solve the following for x . State all restrictions and clearly state your solution(s).

$$\frac{8}{a+6} - \frac{3}{a} = \frac{4}{a+6}$$

13. (4 points) **Bonus:** The cold faucet fills a tub in 10 minutes and the hot faucet fills a tub in 8 minutes. When the drain is open, a full tub empties in 5 minutes. How long does it take for the tub to fill if both taps are on, and the drain is open?