Exam 1

Answer all 20 questions for a total of 100 points. Write your solutions in the space provided, simplify all fractions and radical expressions, and put a box around your final answers. Good luck!

1. (5 points) Express the inequality in interval notation.

$$x \leq -5$$

2. (5 points) Perform the operations and siimplify as one fraction.

$$3 + \frac{2}{10} - \frac{4}{15}$$

3. (5 points) Evaluate the expression numerically.

$$\frac{1 - \frac{1}{8}}{\frac{3}{4} + \frac{1}{6}}$$

4. (5 points) Simplify the expression completely.

$$(-3x^4)^3(2x^4)$$

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5. (5 points) Simplify the expression completely and eliminate any negative exponents.

$$\left(\frac{8a^{-2}}{a^3}\right)^{-1}$$

6. (5 points) Evaluate the expression numerically.

$$4^{3/2} - \frac{\sqrt{72}}{\sqrt{18}}$$

7. (5 points) Perform the indicated operations and simplify.

$$3(2x+1)(x-5) - 4(x^2 - 2x + 1)$$

8. (5 points) Perform the indicated operations and simplify.

$$(2x+3)^2$$

9. (5 points) Factor the expression completely.

$$2(x-3)^2 + 2x(x-3)$$

10. (5 points) Factor the expression completely.

$$x^5 + 5x^4 - 36x^3$$

11. (5 points) Factor the expression completely.

$$36x^2 - 49$$

12. (5 points) Perform the indicated operation and simplify.

$$\frac{8x-3}{2x-1} - 4$$

13. (5 points) Perform the indicated operation and simplify.

$$\frac{x^2-4}{x^2-1} \cdot \frac{x^2+3x-4}{x^2+6+8}$$

14. (5 points) Solve the equation

$$\frac{2x+2}{3} - \frac{9x-6}{4} = \frac{2x-1}{6}$$

15. (5 points) Solve the equation.

$$\frac{6}{x-3} = \frac{5}{x+4}$$

16. (5 points) Solve the equation.

$$\frac{1}{5+x} - \frac{1}{5-x} = \frac{2x-8}{25-x^2}$$

17. (5 points) Find the distance between the points $(1, -4)$ and $(-2, 5)$.

18. (5 points) Find the midpoint of the line segment connecting $(1, -4)$ and $(-2, 5)$.

19. (5 points) Determine which of the given points are on the graph of the equation.

$$\sqrt{x-3} = (y+2)^2$$

(a) $(4, -3)$ (b) $(4, -6)$ (c) $(19, -1)$ (d) $(19, 0)$

20. (5 points) Give an equation of the circle with center $(5, -3)$ that passes through the point $(1, 1)$.