Exam 1
Chapter 1 Algebra Review

Directions: Show your work neatly and clearly to justify each of your answers.

1. Which of the numbers in the set $\{-9, \ \sqrt{3}, \ 3.14, \ \pi, \ 39\}$ are rational?

2. Name the property illustrated by the equality $(3+5)+9=(5+3)+9$.

3. Evaluate, without using a calculator: $\dfrac{6-2\left(3+4^2\right)+7}{-3^2+4}$

4. Evaluate the expression, $-2x^3+5x-1$ for $x=-2$.

For problems 5 and 6, simplify the following expression and write your answer using positive exponents:

5. $-\left(5a^{-2}b^3\right)^2$

6. $\left(\dfrac{10x^{1/2}y^{-1/3}}{25x^{3/2}y^{-2/3}}\right), \ x,y>0$

7. Simplify, without using a calculator: $(-32)^{2/5}$

For problems 8, 9 and 10, factor each expression completely.

8. $3x^2 - 48$

9. $10x^2 - x - 21$

10. $24x^3 - 81$

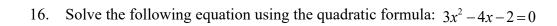For problems 11, 12, and 13, perform the indicated operations and simplify.

11. $\dfrac{2x^2 + 3x - 2}{x^2 + 6x + 8} \cdot \dfrac{2x^2 - 32}{6x - 3}$

12. $\dfrac{x+2}{x^2+2x+1} - \dfrac{2x}{2x^2+x-1}$

13. $\dfrac{\frac{3}{x-4}}{\frac{3}{x}}$

14. Solve the following inequality and express your answer using interval notation: $-4 \le \dfrac{3x-5}{2} < 5$

15. Solve: $\left| 4x - \dfrac{1}{3} \right| = 2$

16. Solve the following equation using the quadratic formula: $3x^2 - 4x - 2 = 0$

17. Find all real solutions: $\sqrt{3x+1} = 1 + \sqrt{x+4}$

18. The height of a ball after being dropped from a point 64 feet above the ground is given by $h = -16t^2 + 64$ where t is the time in seconds since the ball was dropped and h is in feet. When will the ball hit the ground?