Introductory Algebra Evaluation

Algebraic Expressions

1. Simplify:  $9 (10x - 2y) - 5 (x - 4y + 3)$

Solving Equations and Inequalities

2. A student has scores of 4, 10, 5, and 7 on four quizzes. What must he score on the fifth quiz to have an average of 7 or higher? Give the equation used to solve the problem.

3. What is the answer for question 2?

4. Write an expression to represent the shaded region of the figure.

5. What is the value of the shaded region (above) if $x = 1$?

Polynomials: Operations

6. Simplify:  \[
\frac{30x^3y^4}{6x^3y^4}
\]

7. Find the product:  $(5x + 3y)^2$
Polynomials: Factoring

8. Factor completely: $x^2 - 9x + 18$

9. Simplify: $\frac{x^2 + 2x - 3}{x^2 - 3x + 2}$

10. Factor completely: $25x^2 - 9$

Rational Expressions

11. Perform the operation and simplify if possible: $\frac{2x + 8}{x - 3} + \frac{x^2 + 5x + 4}{x^2 - 9}$

12. Perform the operation and simplify if possible: $\frac{x}{x + 3} + \frac{5}{x - 3}$

Graphs and Slopes

13. Graph the line whose slope is $\frac{2}{3}$ and whose x-intercept is $(3,0)$. 

![Graph of a line with slope $\frac{2}{3}$ and x-intercept at $(3,0)$]
14. What is the equation of the line in question 12?

15. Find the slope and y-intercept of $2x + 3y = 8$.

**Systems of Equations**

16. One of the two top-selling music albums of all times, *Jagged Little Pill* (Alanis Morissette), sold 5 million more copies than *Saturday Night Fever* (BeeGees). Combined, the two albums sold 27 million copies. Determine the number of sales for each of the albums.

17. Solve for $x$ and $y$: $5x - 3y = 1$ and $2x - 3y = -5$

**Radicals**

18. Perform the indicated operation and simplify: $\sqrt{6r} \cdot \sqrt{3r}$

19. Perform the indicated operation and simplify: $\sqrt{18} + \sqrt{50}$

20. Express without exponents: $27^{1/3}$
Answer Key

1. $85x + 2y - 15$

2. $4 + 10 + 5 + 7 + x \div 5 \geq 7$

3. $x \geq 9$

4. $(x + 3)(x + 4) - (x + 1)(x + 2)$

5. $14$

6. $5y^8 / x^6$

7. $25x^2 + 30xy + 9y^2$

8. $(x - 3)(x - 6)$

9. $x + 3 / x - 2$

10. $(5x + 3)(5x - 3)$

11. $(x + 3) / (x + 1)$

12. $(x^2 + 2x + 15) / (x^2 - 9)$

13. $y = 2/3x - 2$

14. $m = -2/3, b = 8/3$

15. $AM = 16, BG = 11$

16. $(2, 3)$

17. $3r\sqrt{2}$

18. $8\sqrt{2}$

19. $1/3$