MATH 107
Algebra Self Assessment

Answer all questions without a calculator. Leave all answers in most simple form.

1. In which quadrant does the point \( (2, -6) \) lie?

2. Factor \( (x^2 - 16) \) completely.

3. Solve \( 4(3x + 2) - (x + 5) = -3 \).

4. \( (2x^3y^2)^3 \)

5. \( (x - 2) \) is a factor of which polynomial?
   
   i) \( x^2 - 4x + 4 \)  
   ii) \( x^2 + x - 6 \)  
   
   a) i  
   b) ii  
   c) both  
   d) neither

6. Evaluate \( \frac{3x \cdot 8y^2}{2y \cdot 27x} = \) Make sure your answer in most simple form.

7. \( M - 9 = 1 \) All of the following mean the same as the given equation except:
   
   a) M is one more than nine  
   b) M is nine more than one  
   c) One is nine less than M  
   d) Nine is M less than one
8. Solve for $x$ and $y$:

\[
\begin{align*}
2x + y &= 3 \\
x - 3y &= 12
\end{align*}
\]

9. Solve for $x$ and $y$:

\[
\begin{align*}
4x + 6y &= 12 \\
6x + 9y &= 12
\end{align*}
\]

10. Factor completely: \( 8x^3 - 64 \)

11. \( (9 - 7) - (7 - 9) = \)

12. Evaluate: \( (5\sqrt{3x})^2 = \)

13. Simplify: \( \frac{4x}{5} - \frac{2x}{3} + \frac{x}{2} \)

14. If \( x^2 + m - 6y^2 = (x + 3y)(x - 2y) \) then \( m = \)

15. Simplify: \( \frac{3x^2 - 17x}{6x} \)
16. Which is NOT between -1 and 1?
   a) $-\frac{5}{6}$
   b) $\frac{7}{8}$
   c) $-\frac{9}{8}$
   d) $-\frac{1}{2}$

17. Solve: $-4 + \frac{12}{3} =$

18. Solve. Leave your answer in most simple form: $\frac{3}{7} + \frac{1}{5} =$

19. Simplify: $\sqrt{x^2 + 4x + 4}$

20. Solve. Leave your answer in most simple form: $\frac{4}{9} \times \frac{18}{40}$