MATH 1231 Quiz 1 (50pts)  
Fall 2015  
ANSWERS

No calculators are permitted.

Answer all questions below. Questions 1–9 are worth 4 points each. Circle the letter of the correct answer. There is no partial credit for questions 1–9. There is partial credit for questions 10–12.

1. Simplify the expression: \((5x^4 - 5x) - (2x - 4x^4 - 4)\)
   A. \(9x^4 - 7x - 4\)  
   B. \(9x^4 - 7x + 4\)  
   C. \(3x^4 - 7x + 4\)  
   D. \(4x^4 - 4x + 4\)

2. Simplify the expression: \(3v^4(5v^3 - 4v^2 + 3)\)
   A. \(15v^{12} - 12v^8 + 9v^4\)  
   B. \(15v^7 - 12v^6 + 6v^4\)  
   C. \(15v^7 - 12v^6 + 9v^4\)  
   D. \(8v^7 - 7v^6 + 6v^4\)

3. Simplify the expression: \(\frac{3(a^{-1}b^2)^{-2}}{9a^{-2}b^{-1}}\)
   A. \(\frac{1}{3ab^2}\)  
   B. \(\frac{b^5}{6a^5}\)  
   C. \(\frac{a^5}{3b^5}\)  
   D. \(\frac{a^4}{3b^3}\)

4. Perform the operation and identify the result written in standard form: \(\frac{24x^3 + 30x^6 + 12x^7}{6x^4}\)
   A. \(4x + 5x^2 + 2x^3\)  
   B. \(4x^7 + 5x^{10} + 2x^{11}\)  
   C. \(\frac{4}{x} + 5x^2 + 2x^3\)  
   D. \(\frac{4}{x} + 5x^6 + 2x^7\)

5. Perform the operation and simplify the expression: \((\sqrt[6]{x^5})^6\).
   A. \(x^{30}\)  
   B. \(x^{6/5}\)  
   C. \(x^{5/6}\)  
   D. \(x^5\)

6. If \(x^{2/5}\) is multiplied by \(x^{1/2}\), the result is equal to:
   A. \(x^{5/6}\)  
   B. \(x^{2/10}\)  
   C. \(x^{9/10}\)  
   D. \(x^{5/4}\)  
   E. None of the above
7. If \( f(x) = 3x - x^2 \), then the expression \( f(2 + h) - f(2) \) is equal to:

A. \(-h - h^2\) 
B. \(3h - h^2\) 
C. \(-4h - h^2\) 
D. \(7h + h^2\) 
E. None of the above

8. Factor completely: \( 5x^2 + 13x - 6 \).

A. \((5x - 3)(x + 2)\) 
B. \((5x - 1)(x + 6)\) 
C. \((5x - 2)(x - 3)\) 
D. \((5x + 2)(x - 3)\) 
E. None of the above

9. The solution of the equation: \( 20(2.18)^t = 60 \) is \( t = \) :

A. \(\frac{\ln(3)}{2.18}\) 
B. \(\frac{\ln(3)}{\ln(2.18)}\) 
C. \(\ln\left(\frac{3}{2.18}\right)\) 
D. \(\frac{2.18}{3}\) 
E. None of the above

10. (4 points) Solve the equation \( 16x - 9 = 26 - 8x \). Show work. Write your answer as a fraction or a decimal.
Answer:
\[
16x + 8x = 26 + 9 \quad \cdots 2 \text{ pts} \\
24x = 35 \quad \cdots 1 \text{ pts} \\
x = \frac{35}{24} = 1.46 \quad \cdots 1 \text{ pts}
\]

11. (5 points) Find an equation in the form \( y = mx + b \) of the line that passes through the points \((5, -7)\) and \((-15, 5)\). Show work.
Answer:
\[
m = \frac{5 - (-7)}{-15 - 5} = \frac{12}{-20} = -0.6 \quad \cdots 2 \text{ pts} \\
-7 = -0.6 \times 5 + b, \quad \cdots 1 \text{ pts} \\
b = -4. \quad \cdots 1 \text{ pts}
\]
Then, the line is \( y = -0.6x - 4 \) (1 pts)

12. (5 points) Simplify the following expression completely:
\[
\frac{3}{2} - \frac{1}{x} \cdot \frac{x - 4}{x - 4}
\]
Answer:
\[
\frac{3}{2} - \frac{1}{x} = \left(\frac{3x - 2}{2x}\right) \left(\frac{4x}{8 - x}\right) = \frac{2(3x - 2)}{8 - x}
\]