Basic Algebra Exam 5 (Dougherty)
July 22, 2010

Directions: Scientific calculators are allowed for this exam. Follow directions for each problem carefully. Partial credit is possible if meaningful work is shown to support your answers.

1. Fill in the missing factor in each case below:

\[24x^5 = 6x^4 \cdot \underline{\text{_______}}\]
\[-45a^{12} = -9a^3 \cdot \underline{\text{_______}}\]

2. Factor each of the following as much as possible. If one is prime, state so.

\[6x + 12\]
\[2t^2 + 3t\]

\[6x^3 + 15x^2\]
\[-5x^4 - x^3\]

\[25a^5 + 10a^3\]
\[x(x - 6) - 2(x - 6)\]

\[x^3 + 7x^2 + 4x + 28\]
\[8a^3 - 2a^2 - 12a + 3\]
3. Factor completely. If it is prime, state so.

\[ x^2 + 10x + 16 \quad \text{and} \quad x^2 + 4x + 10 \]

\[ x^2 - 4x - 32 \quad \text{and} \quad x^2 + 11x + 18 \]

\[ 2y^2 + 8y - 90 \quad \text{and} \quad -a^5 - 9a^4 + 90a^3 \]

\[ x^2 - 8 + 16 \quad \text{and} \quad x^2 - 16 \]
4. Factor completely. If it is prime, state so.

(a) \(7y^2 + 15y + 2\)

(b) \(25a^2 - 23a - 2\)

(c) \(12x^2 - 23x + 10\)

(d) \(4x^4 - 64\)
5. Solve each of the following equations (by factoring):

(a) \( x^2 - 9x = 0 \)

(b) \( 6x^2 + 13x - 5 = 0 \)

(c) \( 3x^2 + x = 4 \)

(d) \( x^2 = 49 \)