

Name: \_\_\_\_\_

### College Algebra Exam Review #2

This review has questions over material that has been previously covered. Do this review as if it were a real exam and then check your answers. On problems you have the most difficulty on, go to the corresponding section in the textbook and redo any assigned homework problems.

1. Consider the following polynomial:  $5ab^2 - 7a^2b^5 + a^3b$ .
  - a. Give the degree of this polynomial.
  - b. Determine the coefficient of the term  $ab^2$ .
  
2. Perform the indicated operations and simplify the result.
  - a.  $(5x^2 - 3y^2 + xy) - (x^2 - 3xy + 8y^2) + (9y^2 + xy - 5x^2)$
  
  - b.  $(r^2 + s^2) + (3r^2 + rs - 9s^2) - (10r^2 - 5rs + 10s^2)$
  
  - c.  $(3r + 2s)(r - s)$
  
  - d.  $(x^2 + 5x - 10)(x - 3)$
  
  - e.  $[(m + n) - 6][(m + n) + 6]$

3. Factor each expression as completely as possible. If it cannot be factored, then write PRIME.

a.  $16x^2 - 24x$

b.  $2a^2b^2 - 8a^4b^3 + 20a^6b^4$

c.  $5x^2 + 10x + 3x + 6$

d.  $k^3 + k^2 - 4k - 4$

e.  $3x^2 - 14x - 5$

f.  $4y^2 + 9y^2$

g.  $8t^4 - 48t^3 + 72t^2$

4. Solve each equation by factoring.

a.  $(x - 2)(x^2 + 6x + 9) = 0$

b.  $2t^3 - 8t = 0$

c.  $a(a - 5) + 6a = 30$

d.  $3t^2 + 5 = 17t - 3t^2$

e.  $k^5 - 5k^4 - k^3 + 5k^2 = 0$

5. Divide each of the following using long division. Write the answer in the form: quotient + (remainder / divisor).

a.  $(8x^3 - 12x^2 + 18x - 27) \div (2x - 3)$

b.  $(k^3 + k + 1) \div (k - 1)$

6. Find the domain of each rational function.

a.  $f(x) = \frac{5x}{10 - 3x - x^2}$

b.  $f(x) = \frac{5x}{4x^2 + 25}$

c.  $f(x) = \frac{-1}{2x^3 - x^2 - x}$

7. Perform the indicated operations and simplify completely.

a.  $\frac{a^2b^2}{12a^4b^4} \cdot \frac{16a^2c}{24b^2c}$

b.  $\frac{x^2 + x}{x^2 + 6x - 7} \div \frac{x + 1}{x - 7}$

c.  $\left[ \frac{x^2 - 9}{x^2 - 6x - 7} \div (x + 3) \right] \cdot \frac{3 - x}{x - 7}$

d.  $\frac{3}{xy} + \frac{1}{x^2} - \frac{2}{y^2}$

e.  $\frac{m}{m - n} + \frac{n}{m + n} - \frac{mn}{m^2 - n^2}$

f.  $\frac{4 - \frac{9}{n^2}}{2 + \frac{3}{n}}$

g.  $\frac{\frac{1}{x+h} - \frac{1}{x}}{h}$

8. Solve each equation or inequality for the indicated variable.

a.  $\frac{4x}{3} + x \geq 14$

b.  $\frac{a}{2} - \frac{a}{3} < \frac{a}{4} - 1$

c.  $x - \frac{4}{x} = 0$

d.  $\frac{6}{x+4} - \frac{4}{x} = -1$

e.  $w = \frac{x-1}{x+2}$  for x

f.  $\frac{1}{a} = \frac{1}{b} + \frac{1}{c}$  for b

9. The ratio of two numbers is 3 : 7. The smaller number is 16 less than the larger number. Find the two numbers.