

**Algebra Basics Review**

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

1) For each of the following, identify the major terms, and then identify the major factors in each of the major terms. (2 mark each)

a)  $6 - 2\pi r + 7t$

b)  $4(x - 3) + 5x^2$

c)  $3 - 2x + 7x^2 - x^4$

d)  $3x(x + 1) - 4x^2(x^2 - 1)$

e)  $7(3x - 5)^6$

f)  $3x^2(4x - 3)^8 - 8x^3(4x - 3)^7$

2) Use the distributive property to expand the following and then simplify by collecting like terms. (2 marks each)

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

b)  $(x^2 + 4x - 2)(2x - 3)$

c)  $3xy^2 + 6x^2y - x(y^2 - 4xy)$

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

3) Simplify the following (if possible):

(2 marks each)

a)  $3x^2 \times (-2x^4)$

b)  $9x^3 \div 3x^{-2}$

c)  $3x^2 + (-2x^4)$

d)  $\frac{9x^7y^2}{2x^3y^7}$

e)  $\left(\frac{6x^4}{15x^2}\right)^{-3}$

f)  $\left(\frac{3x^{-2}}{18x^{-7}}\right)^2$

4) Simplify the following fractions by combining exponentials and cancelling common factors. Break up the fractions if needed to cancel factors.

(2 marks each)

a)  $\frac{42x^3(x+3)}{-6x^2(x+3)(x-3)}$

b)  $\frac{25}{(x+1)} \times \frac{14(2x-1)}{5(x-1)} \times \frac{2(x+1)}{35(2x-1)}$

c)  $\frac{25(3x-4)^3(x-4)}{15(x-4)^4}$

d)  $\frac{\frac{4}{(2x-3)}}{\frac{16}{7x(2x-3)^2}}$

$$e) \frac{3(2x-5)^4 - 2(x+1)}{6(2x-5)^2}$$

$$f) \frac{8x(x+3)^2 - 7\sqrt{x}(x+3) + 5(x+3)^4}{(x+3)^4}$$

5) Solve the following addition/subtraction problems using the Lowest Common Denominator and reduce to lowest terms. (3 marks each)

$$a) \frac{5}{6} + \frac{2}{3} - \frac{1}{2}$$

$$b) \frac{13}{30} + \frac{5}{12} - \frac{7}{15}$$

$$c) \frac{5x}{6} + \frac{2}{5}$$

$$d) \frac{1}{3x} + \frac{2}{2x+1}$$

$$e) \frac{5}{6(x+1)(x-3)} + \frac{1}{2(x-1)(x-3)} - \frac{2}{3(x+1)}$$

$$f) \frac{2}{15x^4} - \frac{3}{5x^2(x-1)}$$