

**ECONOMICS 207**  
**SPRING 2007**  
**EXAM 1**

**Problem 1** (12 points). Carry out the following operations. Simplify.

a.  $3^2 * 3^3$

b.  $(2^3)^2$

c.  $(a + b)^2$

d.  $b^{-2}a^2b^{\frac{3}{2}}$

e.  $(3^3 2^x)^2 9^{-2}$

f.  $\left(81x_1^{1/2} x_1^{2/3}\right)^{\frac{1}{4}}$

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*Date:* March 2, 2007.

**Problem 2** (15 points). Simplify, add, subtract, multiply or divide the following fractions. Express all answers in reduced form.

a.  $\frac{195}{65} + \frac{39}{15}$

b.  $\left(\frac{175}{210}\right) \left(\frac{8}{7}\right)$

c.  $\frac{2}{3} + \frac{4}{9} + \frac{5}{12}$

d.  $\frac{5}{16} + \frac{1}{6} + \frac{7}{12} - \frac{3}{24}$

e.  $\frac{2}{3} \frac{5}{6} + \frac{2}{5} - \frac{1}{6} + \left(\frac{3}{5}\right)^{-2}$

**Problem 3** (15 points). Complete the following operations. Simplify as possible.

a.  $e^x e^{3x}$

b.  $\frac{1}{3} \frac{12x_1^{1/3} x_2^{1/2}}{x_1}$

c.  $(5 + 2x)(2x - 5)$

d.  $\frac{(6x^2 + 6x - 36)}{(x + 3)(x - 2)}$

e.  $\frac{(6x^2 + 19x - 20)}{(12x^2 - 28x + 15)}$

**Problem 4** (15 points). Factor the following.

a.  $x^2 - 25$

b.  $12x^2 - 26x - 16$

c.  $8x^2 - 2x - 15$

d.  $6x^2 - 23x - 18$

e.  $10x^2 + 8x - 24$

**Problem 5** (15 points). Solve the following equations for  $x$ .

a.  $3x + 5 = 14$

b.  $\frac{2x + 3}{3x + 5} = \frac{7}{11}$

c.  $\frac{3x + 4}{3} = \frac{7x - 2}{19}$

**Problem 6** (18 points). Solve the following equations for  $x$ .

a.  $10x^2 - 19x + 6 = 0$

b.  $18x^2 - 55x + 42 = 0$

c.  $2x^2 + 15x = 27$

**Problem 7** (10 points). Solve the following systems of equations for  $x_1$  and  $x_2$  using the method of substitution

a.

$$3x_1 - 2x_2 = -9$$

$$-7x_1 + 5x_2 = 22$$

b.

$$-3x_1 - 5x_2 = -21$$

$$x_1 + 2x_2 = 8$$