

**ECONOMICS 207**  
**SPRING 2008**  
**EXAM 1**

**Problem 1** (15 points). Carry out the following operations. Simplify.

a.  $2^3 * 4^2$

b.  $(3^2)^3$

c.  $(a + b)(a - b)$

d.  $b^{-2}a^2a^{1/2}b^{\frac{5}{2}}$

e.  $\left(27x_1^{2/3}x_1^{1/4}\right)^{\frac{1}{3}}$

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*Date:* February 8, 2008.

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

a.  $\frac{198}{66} + \frac{72}{24}$

b.  $\left(\frac{133}{224}\right) \left(\frac{8}{\frac{1}{4}}\right)$

c.  $\frac{1}{3} + \frac{5}{6} + \frac{7}{12}$

d.  $\frac{2}{3} + \frac{10}{27} + \frac{5}{54} - \frac{5}{12}$

e.  $\frac{1}{4} \frac{5}{6} + \frac{5}{2} - \frac{1}{6} + \left(\frac{9}{4} \frac{64}{25}\right)^{-1/2}$

**Problem 3** (12 points). Complete the following operations. Simplify as possible.

a.  $e^x e^{2x}$

b.  $\frac{1}{4} \frac{16x_1^{1/3} x_2^{1/4}}{x_2}$

c.  $(2 + 3x)(5x - 14)$

d.  $\frac{(10x^2 + 11x - 6)}{(20x^2 - 23x + 6)}$

**Problem 4** (16 points). Factor the following.

a.  $9x^2 - 16$

b.  $30x^2 + 33x - 18$

c.  $12x^2 - 23x - 24$

d.  $12x^2 + 28x + 15$

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

a.  $\frac{3x - 5}{4x + 7} = \frac{7}{23}$

b.  $\frac{2x^2 + 3x - 9}{x + 3} = 11$

c.  $\frac{2x^2 + 3x + 9}{x + 3} = 11$

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

a.  $20x^2 - 23x + 6 = 0$

b.  $6x^2 + 19x - 20 = 0$

c.  $24x^2 - 46x + 20 = 5$

**Problem 7** (9 points). Solve the following systems of equations for  $x_1$  and  $x_2$  using the method of substitution

a.

$$x_1 + 5x_2 = -5$$

$$3x_1 + 2x_2 = 11$$



b.

$$16x_1^{-2/3}x_2^{1/4} - 8 = 0$$

$$12x_1^{1/3}x_2^{-3/4} - 3 = 0$$