

Math 108, Business Calculus
Homework #1

Name ANSWER KEY
 Due Wednesday, Jan. 28, 2009, at the beginning of class

1. Use inequality or interval notation to describe the intervals below.

2 pts each

a)  $\{x \mid -1 \leq x \leq 4\}$ or $[-1, 4]$

b)  $\{x \mid x \leq -3\}$ or $(-\infty, -3]$

2. Express each of the following as a single term, eliminating all fractions. (Your answer should look like a single base raised to a single exponent.) Do not evaluate (multiply out) and do not use a calculator. Show all steps to your work.

3 pts each

a) $\frac{3^4(3^{-3})}{(3^5)^2} = \frac{3}{3^{10}} = 3^{-9}$ or $\frac{1}{3^9}$

b) $\frac{\sqrt[3]{2}}{2^{-3}} = \frac{2^{1/3}}{2^{-3}} = 2^3 \cdot 2^{1/3} = 2^{3\frac{1}{3}}$ or $2^{10/3}$

c) $\frac{4 \cdot 16^3}{32} = \frac{4 \cdot (2^4)^{12}}{32} = \frac{1}{8} \cdot 2^3 = \frac{8}{8} = 1$

3. Solve the following by factoring.

3 pts each

a) $x^2 + 3x - 4 = 0$

$(x+4)(x-1) = 0$

$x = -4, x = 1$

b) $2x^2 - 6x + 4 = 0$

$2(x^2 - 3x + 2) = 0$

$2(x-2)(x-1) = 0$ $x = 2, x = 1$

c) $x^3 + 5x^2 + 4x = 0$

$x(x^2 + 5x + 4) = 0$

$x(x+4)(x+1) = 0$ $x = 0, x = -4, x = -1$

4. Solve the following.

a) $x^2 + 2x - 5 = 0$

$x = \frac{-2 \pm \sqrt{4 - 4(1)(-5)}}{2} = \frac{-2 \pm \sqrt{24}}{2}$ or $-1 \pm \sqrt{6}$

3 pts each

b) $2x^2 + 4x = -1$

$2x^2 + 4x + 1 = 0$

$x = \frac{-4 \pm \sqrt{16 - 4(2)(1)}}{4} = \frac{-4 \pm \sqrt{8}}{4}$ or $\frac{-2 \pm \sqrt{2}}{2}$
 or $-1 \pm \frac{\sqrt{2}}{2}$