MA 160 Quiz #1 - Summer, 2008

(20 points) Name Solutions

[redacted]

Show all of your work on the quiz paper. Full credit is not given unless the answer follows from the work shown.

2. (2 points) A function f is given by $f(x) = 2x^2 - 7x + 4$. Find and simplify $f(a+3)$.

$$f(a+3) = 2(a+3)^2 - 7(a+3) + 4$$
$$= 2(a^2 + 6a + 9) - 7a - 21 + 4 = 2a^2 + 5a + 1$$

3. (2 points) If $f(x) = \begin{cases} 4x^2 - 8 & for \quad x < -2 \\ 3x + 10 & for \quad x \geq -2 \end{cases}$

Evaluate

(a) $f(-5) = 4(25) - 8 = 92$

(b) $f(-2) = 3(-2) + 10 = 4$

4. (2 points) Express each of the following in interval notation.

(a) $-3 < x \leq 7$ $(-3, 7]$

(b) $x > 4$ $(4, \infty)$

5. (4 points) Solve the equation.

$$x(x - \frac{8}{x}) = 3x$$
$$x^2 - 8 = 3x$$
$$x^2 - 3x - 8 = 0$$
$$x = \frac{3 \pm \sqrt{(-3)^2 - 4(1)(-8)}}{2} = \frac{3 \pm \sqrt{41}}{2}$$

6. (2 points) Factor the polynomial $3x^2 - 6x - 24$. $3(x^2 - 2x - 8) = 3(x-4)(x+2)$

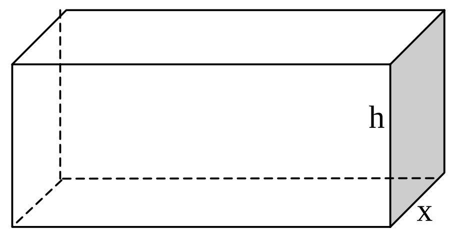
7. (1 point) Rewrite using positive exponents: $-7x^{-5} = -\frac{7}{x^5}$

8. (2 points) Rewrite each radical expression in exponential notation.

(a) $\sqrt[4]{x^3} = x^{3/4}$ (b) $x^3\sqrt{x} = x^3 x^{1/2} = x^{7/2}$

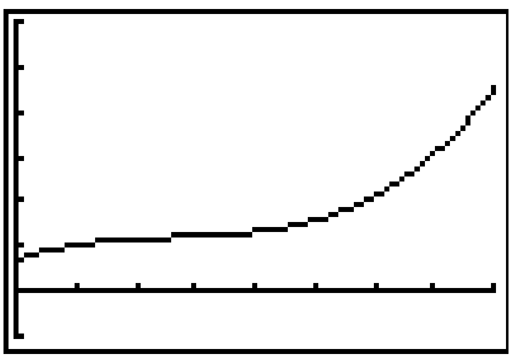
9. (3 points) A rectangular box open at the top has length equal to three times the width. If x represents the width and h represents the height of the box, write a formula for the surface area of the box.

$S = 3x^2 + 2xh + 2(3xh) = 3x^2 + 8xh$



10. (4 points) The daily cost (in dollars) of producing x units of a certain product is given by the function $C(x) = 347 + 23.8x - 0.8x^2 + 0.01x^3$.

(a) Graph $C(x)$ on the window [0, 80] by [-500, 3000] and copy your graph into the space below.



(b) What is the cost of producing 45 items? C(45) = $709.25

(c) What is the additional cost of increasing the number of items produced from 45 to 46?

C(46) – C(45) = $722.36 - $709.25 = $13.11

(d) At what production level will the daily cost be $1300? Round your answer to the nearest integer. The daily cost will be $1300 at production level x = 66.