

NAME: \_\_\_\_\_

- I deeply regret having to miss yet another class. However Dr. Albig has generously agreed to host your class today.
- This worksheet covers topics in Sections 0.1 through 0.4 in your text. You may work together, use your text, and ask questions of Dr. Albig. Please submit your finished work to Dr. Albig.
- Total of 24 possible points.
- Show all work (use additional paper).
- Decimal answers must be accurate to 3 places beyond the decimal.
- You may use technology to verify your results. But your answer must be accompanied by work that justifies your conclusions.

1. **(6 points)** (This problem is similar to 0.1.31 in your text.) Be sure that you review enough of the material to understand interval notation and how to solve an inequality.

- (a) Explain in words the difference between  $[1, 3]$  and  $(1, 3)$ .
- (b) The revenue  $R$  from selling  $x$  units of a product is given by

$$R = 17.95x$$

This means that the product is sold for \$17.95 per item. The cost  $C$  of producing  $x$  units is

$$C = 15x + 200$$

This means that the cost of production is \$15 per item, and there is an additional *fixed cost* of \$200. To obtain a profit, the revenue must be *greater than* the cost. Find the values of  $x$  for which a profit is earned.

- (c) Express your answer as an interval of values for  $x$ .

2. **(6 points)** (This problem is similar to 0.2.40 and 0.2.43 in your text.) Review enough material to understand absolute value notation, and that  $|x - 2| < 3$  represents an interval of  $x$  values.

- (a) Find an interval of  $x$  values that satisfy the inequality  $|x - 1| \leq 5$
- (b) A contractor estimates the cost of construction to be  $E$  dollars. If the actual cost  $A$  of construction is within \$100 of  $E$ , the client is happy. Otherwise, there is a penalty if the actual cost is more than \$100 either above or below the estimate. Write an inequality in absolute values that represents the “happy” situation.
- (c) Find the interval of actual costs  $A$  that will result in a “happy” situation if the estimated cost is  $E = \$800$ .

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3. **(6 points)** (This problem is similar to 0.3.47 and 0.3.48 in your text.) Review enough material to understand the notation for radicals and rational exponents. Be sure you can compute these values on your calculator.

(a) Use your calculator to evaluate  $x^{-2/3}$  for  $x = -8$

(b) Find the domain (the set of acceptable  $x$  values) for the expression  $\frac{5}{\sqrt{9-x}}$

(c) Find the domain for the expression  $\frac{5}{\sqrt[3]{9-x^2}}$

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4. **(6 points)** (This problem is similar to 0.4.3 and 0.4.9 in your text.) Review enough material to understand factoring of polynomials. Look up the quadratic formula, and be sure you know how to use it.

(a) Use the quadratic formula to find all real zeros of the polynomial  $2x^2 - x - 1$

(b) Factor the polynomial  $2x^2 - x - 1$

(c) Solve the quadratic equation  $2x^2 - x - 1 = 0$