Math-1003b Practice Exam #2

This exam is closed book and notes. You may use a scientific calculator; however, no other electronics are allowed. Show all work; there is no credit for guessed answers. All answers must be in factored form, where appropriate. All numerical answers must be expressed using exact values, unless you are specifically asked for an approximate (decimal) value. All intervals must be expressed in interval notation.

1). A company makes metal pipe for the plumbing industry. The cost to make a particular type of pipe varies directly with the length of the pipe and inversely with the diameter of the pipe (smaller pipes are harder to make).

   a). Let $p =$ the cost to make each pipe, $L =$ length of each pipe and $d =$ diameter of each pipe. Write an equation that expresses the cost of each pipe in terms of L and d.

   b). What is the value of the constant of proportionality if the cost per pipe is 80 cents when making a 2 foot pipe with a diameter of half an inch?

   c). What is the cost per pipe for a 5 foot pipe with a 2 inch diameter?

2). Solve the compound inequality for x:

$$-6 \leq -5(x+1)+4 < 9$$

3). Solve the following system of inequalities for x:

$$x-1 \geq 3 \quad \text{or} \quad -2(x-5) < 6$$

4). Solve for x using test points:

$$x^2+7x-18 > 0$$

5). Solve for x using test points:

$$\frac{x-5}{x+2} \leq 0$$

6). Solve for x:

$$3\,|2x+1|-1 = 8$$

7). Solve for x:

$$|3x-1| = -2$$

8). Solve for x:

$$3\,|4x+1|-5<7$$

9). Solve for x (Hint: Look at the previous problem):

$$3\,|4x+1|-5\geq 7$$

10). Solve the following system of inequalities by graphing. Be sure to label all key points and make it absolutely clear which region(s) of the plane you are selecting for your answer:

$$\begin{cases} y\geq -1 \\ x-y<2 \end{cases}$$