Math 099 Quiz #2 KEY

Directions: Please show all your work and be neat and organized to receive credit.

1. (6 points) Solve the following inequality. Write your answer in set notation: $3-\frac{2}{5}x>7$.

$5(3)-5(\frac{2}{5}x)>(7)5$

$15-2x>35$

$-15 \quad -15$

$-2x>20$

$x<-10$

$\{x \mid x<-10\}$

2. (8 points) In the Bogart temperature scale, a temperature of 20°C corresponds to a temperature of 33°B and a temperature of 100°C corresponds to a temperature of 93°B. Express the Celcius temperature C in terms of the corresponding Bogart temperature B.

$20°C \to 33°B$

$100°C \to 93°B$

$(33, 20) \quad (93, 100)$

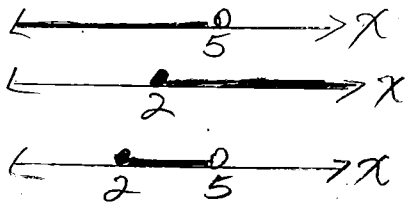
$m = \frac{20-100}{33-93} = \frac{-80}{-60} = \frac{8}{6} = \frac{4}{3}$

$C = 20 + \frac{4}{3}(B-33)$

3a. (5 points) Sketch a graph of the intersection of the sets $\{x \mid x < 5\}$ and $\{x \geq 2\}$, and write this intersection using set notation.

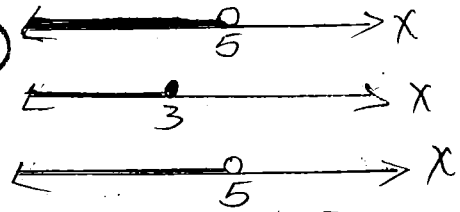
b. (5 points) Sketch a graph of the union of the sets $\{x \mid x < 5\}$ and $\{x \leq 3\}$, and write this union using set notation.

a)



$\{x \mid 2 \leq x < 5\}$

b)



$\{x \mid x < 5\}$

4. (6 points) The height of a balloon t hours after 2:00pm is given by the function

$$H(t) = 1200 - 150t \quad , \quad 0 \leq t \leq 6.$$

When is the balloon at least 800 feet above the ground? (Do this problem on the back.)

$H(t) = 1200 - 150t$ $0 \leq t \leq 6$ 2:00 PM at least 800 f

$1200 - 150t \geq 800$

$-1200 \quad -1200$

$-150t \geq -400$

$t \leq \frac{8}{3}$

$\frac{400}{150} \quad \frac{8}{3} = 2\frac{2}{3}$

$\frac{2}{3} \times 60 = 40$

2hrs 40 Mins

The balloon is at least 800 feet between 2:00 PM and 4:40PM.