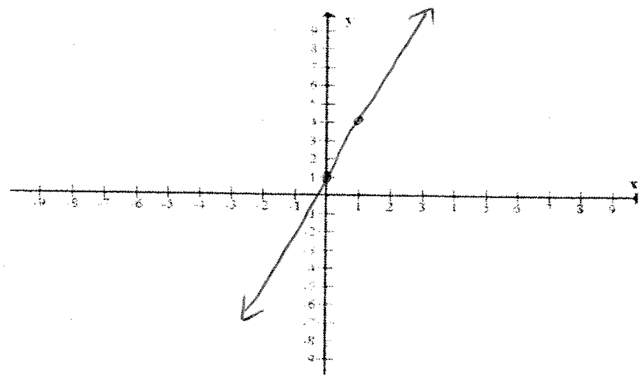
MATH 1200 **Spring 2017 Exam 2B** **Name:** Solutions

Show **all your work** to get full/ partial credit. Each problem is worth 5 points.

1. Graph $y = 2x + 1$.

x	y
0	1
1	3



2. Given -2x + 4y = 12, graph
   a. The x-intercept. [5 points]

   ~~4y=12~~ $-2x = 12$
   $\Rightarrow x = -6 \Rightarrow (-6, 0)$

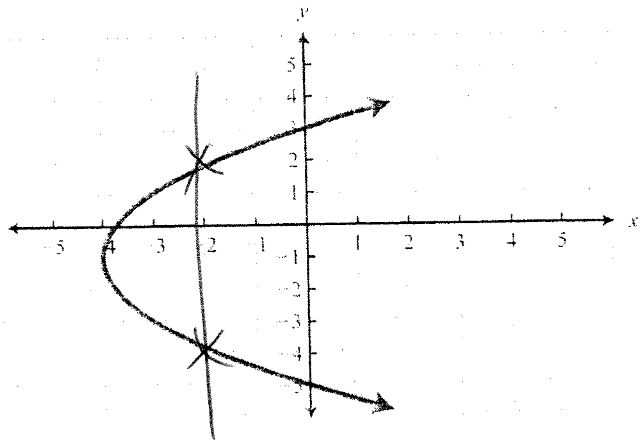
   b. The y-intercept. [5 points]

   $4y = 12$
   $\Rightarrow y = 3 \Rightarrow (0, 3)$

3. Determine the center and radius of the circle: $(x - 4)^2 + (y + 2)^2 = 81$

   Center: $(4, -2)$
   radius: $\sqrt{81} = 9$

4. Check if the given relation defines y as a function of x, explain your reasons.



No, does not pass VLT.

5. Solve $x^2 + 4x - 8 = 0$ using completing the square.

$x^2 + 4x = 8$

$x^2 + 4x + 4 = 8 + 4$

$(x+2)^2 = 12$

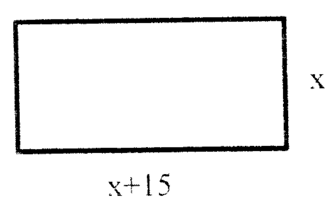
$x + 2 = \pm\sqrt{12} \Rightarrow \boxed{x = -2 \pm 2\sqrt{3}}$

6. If set $A = \{ x \mid x \leq 6 \}$ and set $B = \{ x \mid x \geq -1 \}$, find $A \cap B$

$\{x \mid -1 \leq x \leq 6\}$

7. a. Write an equation that indicates that the area is $250yd^2$. [5 points]

$x(x+15) = 250$



b. Find the length and the width of the rectangle. [5 points]

$x^2 + 15x - 250 = 0$

$(x+25)(x-10) = 0$

$\Rightarrow x = 10$

$\Rightarrow$ $\boxed{\text{length} = 25;\ \text{width} = 10}$

8. a. Solve $x + \frac{6x+30}{x^2-25} = 0$. [5 points]

$$x + \frac{6(x+5)}{(x+5)(x-5)} = \frac{x(x-5)}{(x-5)} + \frac{6}{x-5} = \frac{x^2-5x+6}{x-5} = 0$$

$$\Rightarrow x^2 - 5x + 6 = 0 \Rightarrow (x-6)(x+1) = 0 \Rightarrow \boxed{x = 6, -1}$$

b. Find restrictions on the function, if any. [5 points]

$$x \neq 5 \; ; \; x \neq -5$$

9. Solve the equation: $\sqrt{2x-4} = 6$.

$$\cancel{2x+1} \quad 2x - 4 = 36$$
$$2x = 40$$
$$x = 20$$

10. Solve $2x - 9 < 6(x-1) - 3x$.

$$2x - 9 < 6x - 6 - 3x$$
$$2x - 9 < 3x - 6$$
$$-3 < x$$

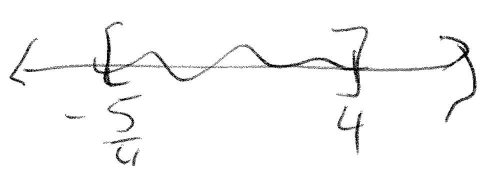
11. Given $-2 \leq \frac{4x-1}{3} \leq 5$.

a. Solve the compound inequality. [5 points]

$$-2(3) \leq 4x - 1 \leq 5(3)$$
$$-6 \leq 4x - 1 \leq 15$$
$$-5 \leq 4x \leq 16$$
$$-\frac{5}{4} \leq x \leq 4$$

b. Write the solution set in interval notation and graph. [5 points]

$$\left[-\frac{5}{4}, 4\right] \; ;$$



12. Solve the equation: $|3x + 5| = |x + 1|$.

$3x+5 = x+1$ or $3x+5 = -(x+1)$

$2x = -4$ $\qquad$ $3x+5 = -x-1$

$x = -2$ $\qquad$ $4x = -6$

$x = -\frac{6}{4} = \frac{-3}{2}$

13. Solve $|x - 3| \le 4$.

$-4 \le x - 3 \le 4$

$-1 \le x \le 7$

14. Solve $2|x + 3| - 4 \ge 6$.

$2|x+3| \ge 10$

$|x+3| \ge 5$

$x+3 \ge 5$ or $x+3 \le -5$

$x \ge 2$ or $x \le -8$

15. Find the midpoint of the line segment whose endpoints are:
(-1,-3) and (3,-7)

$\left(\frac{-1+3}{2}, \frac{-3-7}{2}\right) = (1, -5)$

16. Find the distance between the points: (1,1) and (2,3).

$\sqrt{(1-2)^2+(1-3)^2} = \sqrt{1+4} = \sqrt{5}$