INTERMEDIATE ALGEBRA   EXAM 4 U*   NAME _____
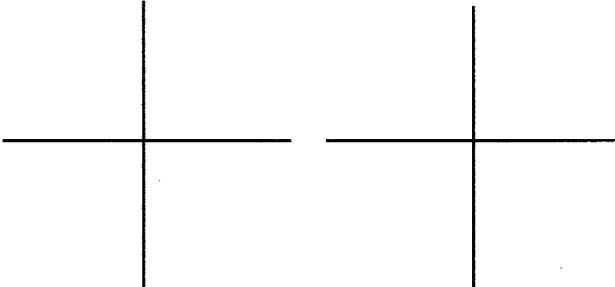
SHOW <u>ALL</u> WORK ON THIS TEST OR ON SEPARATE PAPER. Circle answers.
TURN IN <u>ALL</u> WORKSHEETS. CALCULATORS ARE ALLOWED ON THIS TEST.

In 1 - 2, graph the equations, and complete the blanks:

1. **$4x - 3y = -12$**

x-int = ____

y-int = ____

slope = ____

2. $y = -\dfrac{4}{3}x + 3$

y-int = ____

Slope = ____

3. Given the points (-2, -4) and (4, -6), find:

   a) distance   b) slope   c) midpoint

4. Find the slope of a line that is
   a) parallel to 3x - 5y = 15   b) perpendicular to 3x - 5y = 15

In 5 - 8, find the *equation of the line* in *y = mx + b* form:

5. with slope 2/3 passing through (-6, 4).   6. passing through (-2,3) and (0, -2).

7. through (-5, 4) and a) parallel to $y = -\dfrac{4}{3}x + 3$ b) perpendicular to $y = -\dfrac{4}{3}x + 3$

1

In 8 - 11, solve the systems of equations, showing all work by algebra methods
(you may check with calculators):

8. $2x - 3y = 22$
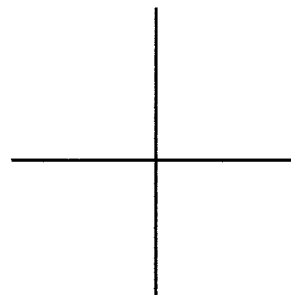 $x - y = 8$

9. $4x - 3y = -6$
    $-8x + 6y = 12$

10. $7x + 5y = -3$
     $10x + 7y = -5$

11. $6x - 7y = 20$
     $y = 2x + 4$

12. Graph the <u>intersection</u> of the inequalities:

$2x - y \leq -2$

$y > -x + 3$

13. If $f(x) = 3x - 4$ and $g(x) = x^2 - 4x + 5$

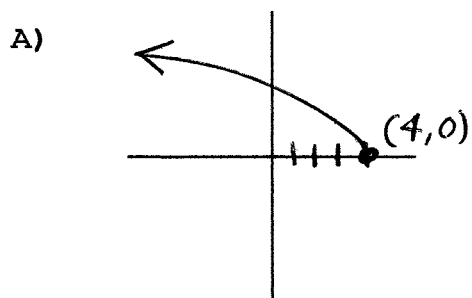   a) $f(4) =$ b) $g(4)$ c) $f(-4)$

   d) $g(-4) =$ e) $f(5X) =$

14. Find the domain (give interval notation when appropriate):

   a) $Y = \dfrac{3X}{X + 3}$ b) $Y = X^2 - 4$ c) $y = \dfrac{x - 5}{x^2 - x - 6}$ d) $Y = \sqrt{6 - X}$
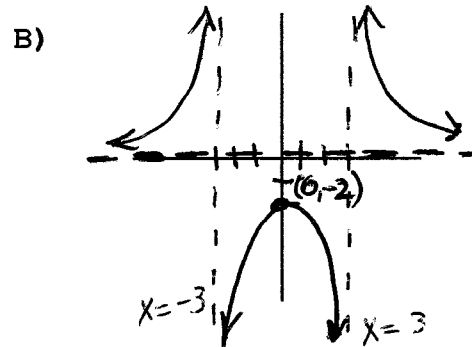
15. Find the domain and range of each of the following graphs. Determine whether each is a function or not a function.

   A)

   (4,0)

   B)

   (6,-2)

   $X = -3$ $X = 3$

   Function? _____   Function? _____

   Domain: _____   Domain: _____
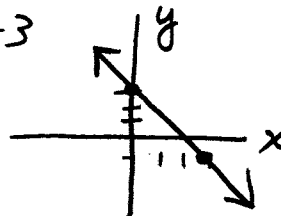
   Range: _____   Range: _____

INTERMED. ALG EXAM 4U   Solutions

1. $4x - 3y = -12$

x int = -3

Y int = 4

$m = \frac{4}{3}$
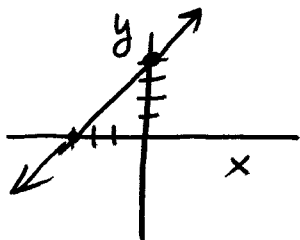
2. $y = \frac{-4}{3}x + 3$

Y int = 3

$m = -\frac{4}{3}$

3. $(-2, -4)$ $(4, -6)$

a) $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

$= \sqrt{6^2 + 2^2}$

$= \sqrt{40} = \boxed{2\sqrt{10}} \approx \boxed{6.32}$

b) $m = \frac{y_2 - y_1}{x_2 - x_1}$

$= \frac{-6 - (-4)}{4 - (-2)}$

$= -\frac{2}{6} = \boxed{-\frac{1}{3}}$

c) midpt $\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$

$\left(\frac{-2 + 4}{2}, \frac{-4 + (-6)}{2}\right)$

$\boxed{(1, -5)}$

4. $3x - 5y = 15$

$-5y = -3x + 15$

$y = \frac{3}{5}x - 3$

$m = \frac{3}{5}$

a) m parallel $\boxed{\frac{3}{5}}$

b) $m_\perp = \boxed{-\frac{5}{3}}$

5. $m = \frac{2}{3}$ $(-6, 4)$

$y = mx + b$

$4 = \frac{2}{3}(-6) + b$

$4 = -4 + b$

$8 = b$

$\boxed{y = \frac{2}{3}x + 8}$

6. $(-2, 3)$ $(0, -2)$

$m = \frac{-2 - 3}{0 - (-2)}$

$= -\frac{5}{2}$

y int = $(0, -2)$

so $b = -2$

$\boxed{y = -\frac{5}{2}x - 2}$

7a) $m = -\frac{4}{3}$ $(-5, 4)$

$y = mx + b$

$4 = -\frac{4}{3}(-5) + b$

$12 = 20 + 3b$

$-8 = 3b$

$b = -\frac{8}{3}$

$\boxed{y = -\frac{4}{3}x - \frac{8}{3}}$

7b) $m_\perp = \frac{3}{4}$ $(-5, 4)$

$y = mx + b$

$4 = \frac{3}{4}(-5) + b$

$16 = -15 + 4b$

$31 = 4b$

$b = \frac{31}{4}$

$\boxed{y = \frac{3}{4}x + \frac{31}{4}}$

8. $2x - 3y = 22$

$-2(x - y = 8)$

$\underline{\begin{array}{c} 2x - 3y = 22 \\ -2x + 2y = -16 \end{array}}$

$-y = 6$

$\boxed{y = -6}$

$x - y = 8$

$x - (-6) = 8$

$x + 6 = 8$

$\boxed{x = 2}$

$\boxed{(2, -6)}$

9. $2(4x - 3y = -6)$

$-8x + 6y = 12$

$\underline{\begin{array}{c} 8x - 6y = -12 \\ -8x + 6y = 12 \end{array}}$

$0 = 0$

$\boxed{\text{Same Line}}$

10. $7(7x + 5y = -3)$

$-5(10x + 7y = -5)$

$\underline{\begin{array}{c} 49x + 35y = -21 \\ -50x - 3y = 25 \end{array}}$

$-x = 4$

$\boxed{x = -4}$

$7x + 5y = -3$

$-28 + 5y = -3$

$5y = 25$

$\boxed{(-4, 5)}$ $\boxed{y = 5}$

11. $6x - 7y = 20$

$y = 2x + 4$

$6x - 7(2x + 4) = 20$

$6x - 14x - 28 = 20$

$-8x = 48$

$\boxed{x = -6}$

$y = 2x + 4$

$y = -12 + 4 = \boxed{-8}$

$(-6, -8)$

12.

$2x - y \le -2$

Solid

Shade above

x	y
0	2
-1	0

$y > -x + 3$

y int = 3 m = -1

Dotted Line

Shade above.

(Solution cross Shaded area!)

13. $f(x) = 3x - 4$ $g(x) = x^2 - 4x + 5$

a) $f(4) = 3 \cdot 4 - 4$

$= \boxed{8}$

b) $g(4) = 4^2 - 4 \cdot 4 + 5$

$= \boxed{5}$

c) $f(-4) = 3 \cdot (-4) - 4$

$= \boxed{-16}$

d) $g(-4) = (-4)^2 - 4(-4) + 5$

$= 16 + 16 + 5 = \boxed{37}$

e) $f(5x) = 3(5x) - 4$

$= \boxed{15x - 4}$

14a) $y = \frac{3x}{x + 3}$

D: all $x + 3 \ne 0$

$\boxed{x \ne -3}$

b) $y = x^2 - 4$

No restrict!

$\boxed{(-\infty, \infty)}$

c) $y = \frac{x - 5}{x^2 - x - 6}$

D: all $x^2 - x - 6 \ne 0$

$(x - 3)(x + 2) \ne 0$

$\boxed{x \ne 3, -2}$

d) $y = \sqrt{6 - x}$

D: $6 - x \ge 0$

$-x \ge -6$

$x \le 6$

$\boxed{(-\infty, 6]}$

15A)

F? Yes

D: $(-\infty, 4]$

R: $[0, \infty)$

15B) F? Yes

D: all $x \ne \pm 3$

R: $(-\infty, -2] \cup (0, \infty)$