INTERMEDIATE ALGEBRA   EXAM 4 CR*   NAME _____
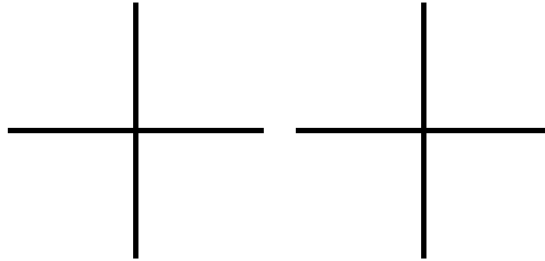
**SHOW ALL WORK ON THIS TEST OR ON SEPARATE PAPER. Circle answers.
TURN IN __ALL__ WORKSHEETS. CALCULATORS ARE PERMITTED ON THIS TEST.**

1. Graph the equations:

a) $y = \dfrac{3}{2}x + 6$

slope = _____

y-int = _____

b) $3x + 2y = -10$

x-int = _____

y-int = _____

2.   Given the points (–4, 1) and (6, –5), find:

a) midpoint   b) slope   c) distance

3.   Find the __equation__ of the line (in y = mx + b form) passing through (5 , –1) and (3 , 4).

In 4 - 5, find the equation of the line (y=mx+b form) that passes through (–3 , 5) and is

4.   parallel to 5x + y = –10.   **5.   perpendicular to 5x + y = –10.**

In 6 – 9, solve the systems of equations. Show work algebraically!

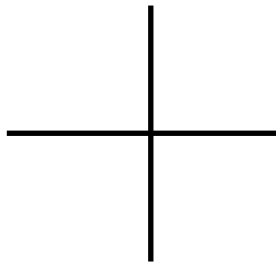6. $3x + 5y = 10$
    $x + 2y = 1$

7. $y = 4 - x$
    $2x - y = 11$

8. $3x + 5y = 14$
    $4x + 9y = 7$
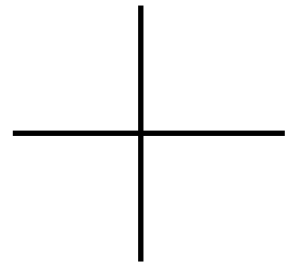
9. $4x - 3y = -6$
    $-8x + 6y = 12$

10. Graph the <u>intersection</u> of

    $y \leq 3x + 3$
    $2x + 5y > 10$

11. Graph the union of

    $y \geq -3x + 3$
    $2x - 5y < 10$

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12. If $f(x) = \dfrac{x+2}{x-6}$

   a) f(2) =   b) f(–2) =   c) f(6) =

   d) f(–6) =   e) f(Junk)=

In 13 - 14, find the domain (interval notation when appropriate):

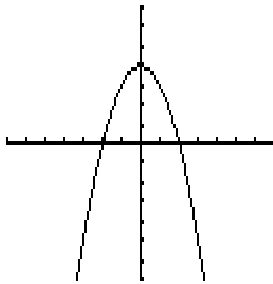13a) $y = x - 4$ b) $y = \dfrac{x-6}{3x+2}$ 14a) $y = \sqrt{6-x}$ b) $y = \dfrac{x+4}{x^2 - 7x - 18}$

In 15-16, find the domain and range of each of the following graphs. Determine whether each is a function or not a function.
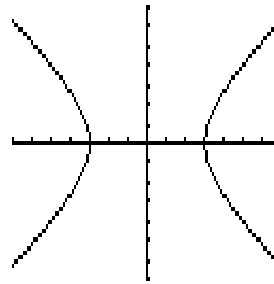
15.

16.

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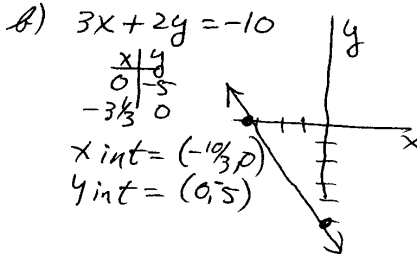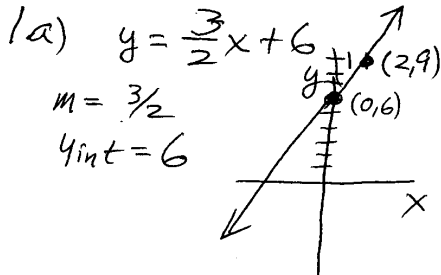
Range: _____   Range: _____

Function? _____   Function? _____

1a) $y = \frac{3}{2}x + 6$

$m = \frac{3}{2}$

$y int = 6$

$y + 1$ $(2,9)$

$(0,6)$

b) $3x + 2y = -10$

x	y
0	-5
$-3\frac{1}{3}$	0

$x int = (-\frac{10}{3}, 0)$

$y int = (0, -5)$

2. $(-4,1)\ (6,-5)$

a) mid $\left(\frac{-4+6}{2}, \frac{1+(-5)}{2}\right)$

$(1, -2)$

b) $m = \frac{-5-1}{6-(-4)} = \frac{-6}{10}$ $\left(\frac{-3}{5}\right)$

c) $d = \sqrt{10^2 + 6^2}$

$= \sqrt{136} = \sqrt{4 \cdot 34}$

$= 2\sqrt{34} \approx 11.66$

3. $(5,-1)\ (3,4)$

$m = \frac{4-(-1)}{3-5} = \frac{5}{-2}$

$y = mx + b$

$-1 = -\frac{5}{2}(5) + b$

$-2 = -25 + 2b$

$23 = 2b$

$b = \frac{23}{2}$ $\left(y = \frac{-5}{2}x + \frac{23}{2}\right)$

4. $(-3,5)$

$5x + y = -10$

$y = -5x - 10$

$m = -5$

$y = mx + b$

$5 = (-5)(-3) + b$

$5 = 15 + b$

$-10 = b$

$\left(y = -5x - 10\right)$

5. $(-3,5)$

$m = -5 \quad m_\perp = \frac{1}{5}$

$y = mx + b$

$5 = \frac{1}{5}(-3) + b$

$25 = -3 + 5b$

$28 = 5b$

$b = \frac{28}{5}$

$\left(y = \frac{1}{5}x + \frac{28}{5}\right)$

6. $3x + 5y = 10$

$-3 \quad x + 2y = 1$

$3x + 5y = 10$

$-3x - 6y = -3$

$-y = 7$

$\left(y = -7\right)$

$x + 2(-7) = 1$

$x - 14 = 1$

$\left(x = 15\right)$

Ck: $3x + 5y = 10$

$3(15) + 5(-7) = 10$

$45 - 35 = 10$

7. $y = 4 - x$

$2x - y = 11$

$2x - (4-x) = 11$

$2x - 4 + x = 11$

$3x = 15$

$\left(x = 5\right)$

$y = 4 - x$

$y = 4 - 5 = -1$

$\left(y = -1\right)$

Ck: $2x - y = 11$

$2(5) - (-1) = 11$

$10 + 1 = 11$

8. $4(3x + 5y = 14)$

$-3(4x + 9y = 7)$

$12x + 20y = 56$

$-12x - 27y = -21$

$-7y = 35$

$\left(y = -5\right)$

$3x + 5(-5) = 14$

$3x - 25 = 14$

$3x = 39$

$\left(x = 13\right)$

Ck: $4x + 9y = 7$

$4(13) + 9(-5) = 7$

$52 - 45 = 7$

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

$-8x + 6y = 12$

$8x - 6y = -12$

$-8x + 6y = 12$

$0 = 0$

$\left(\text{Same Line}\right)$
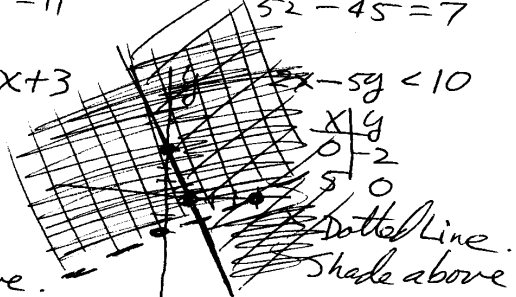
10. $y \leq 3x + 3$

$y int = 3$

$m = \frac{3}{1}$

Solid Line

Shade below

$2x + 5y > 10$

Dotted Line

Shade above

INTERSECTION

11. $y \geq -3x + 3$

$y int = 3$

$m = \frac{-3}{1}$

Solid Line

Shade Above

$x - 5y < 10$

x	y
0	-2

Dotted Line

Shade above
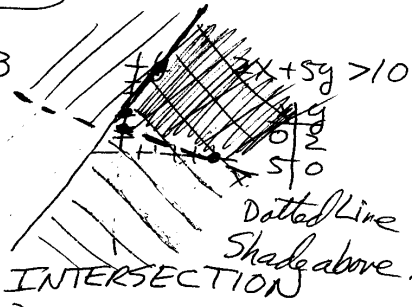
UNION

12. $f(x) = \frac{x+2}{x-6}$

a) $f(2) = \frac{2+2}{2-6} = \frac{4}{-4} = -1$

b) $f(-2) = \frac{-2+2}{-2-6} = \frac{0}{-8} = 0$

c) $f(6) = \frac{6+2}{6-6}$ Undefined

d) $f(-6) = \frac{-6+2}{-6-6} = \frac{-4}{-12} = \frac{1}{3}$

e) $f(J) = \frac{Jx+2}{Jx-6}$

13a) $y = x - 4$

D: $(-\infty, \infty)$

b) $y = \frac{x-6}{3x+2}$

D: $3x + 2 \neq 0$

all $(x \neq -\frac{2}{3})$

14a) $y = \sqrt{6-x}$

D: $6 - x \geq 0$

$-x \geq -6$

$x \leq 6$

$(-\infty, 6]$

b) $y = \frac{x+4}{(x-9)(x+2)}$

D: all $x \neq 9, -2$

15. D: $(-\infty, \infty)$

R: $(-\infty, 4]$

16. D: $(-\infty, -3] \cup [3, \infty)$

R: $(-\infty, \infty)$

F? No.

E? Yes

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