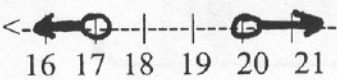
Math 090
Exam 2

Name Key

Show your work for full credit.

1. Write an inequality whose solution is the graph  (3 pts)

1. $x < 17$ or $x > 20$

2. Solve $2 \leq 4x + 6 \leq 18$ (3 pts)

$2 \leq 4x+6$ $\quad -6 \quad -6$

$\frac{-4}{4} \leq \frac{4x}{4}$

$4x+6 \leq 18$ $\quad -6 \quad -6$

$\frac{4x}{4} \leq \frac{12}{4}$

2. $-1 \leq x \leq 3$

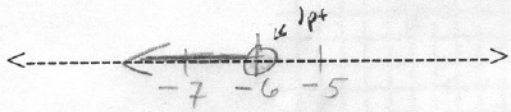
3. Solve and graph $-x - 5 > 1$ (3 pts)

$+5 \quad +5$

$\frac{-x}{-1} > \frac{6}{-1}$ flip 2pts

$x < -6$

3. $x < -6$



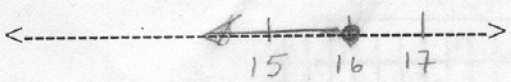
4. Solve and graph $\frac{x}{4} - 5 \leq -1$ (3 pts)

$+5 \quad +5$

$4\left(\frac{x}{4}\right) \leq (4)4$

$x \leq 16$

4. $x \leq 16$



5. Complete the ordered pairs for the equation $4x - 2y = 12$. (3 pts)

(1, −4), (-3, −12), ($\frac{7}{2}$, 1)

$4(1) - 2y = 12$ $\quad -4$

-4

$\frac{-2y}{-2} = \frac{8}{-2} \Rightarrow y = -4$

$4(-3) - 2y = 12$ $\quad +12 \quad +12$

$\frac{-2y}{-2} = \frac{24}{-2}$

$y = -12$

$4(x) - 2(1) = 12$ $\quad +2 \quad +2$

$\frac{4x}{4} = \frac{14}{4} = \frac{7}{2}$

6. Find the slope of a line that passes through (8, -5), (-8, 7). (2 pts)

$\frac{7+(+5)}{-8-8} = \frac{12}{-16} = -\frac{3}{4}$

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

7. Write the equation of a line, in slope-intercept form, given: m = $\frac{1}{2}$ that passes through the point (4, -1). (3 pts)

$y-(-1) = \frac{1}{2}(x-4)$

$y+1 = \frac{1}{2}x - 2$ $\quad -1 \quad -1$

7. $y = \frac{1}{2}x - 3$

20

8. Which of the following ordered pairs are solutions to $3x - 4y = 12$? (3 pts)

$(0, 3)$, $(4, 3)$, $(\frac{16}{3}, 1)$

$3(0) - 4(3) \neq 12$

$3(4) - 4(3) \neq 12$

$3(\frac{16}{3}) - 4(1) = 12$

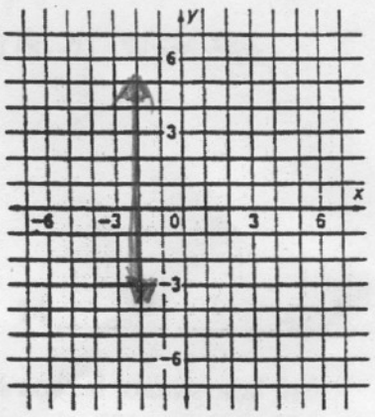
$16 - 4 = 12$

$12 = 12$

8. $(\frac{16}{3}, 1)$

9. Graph: $x = -2$ (2 pts)

x	y
-2	0
-2	2
-2	-1



10. Find the x-intercept and the y-intercept, then graph: $-x + 2y = 6$. (3 pts)

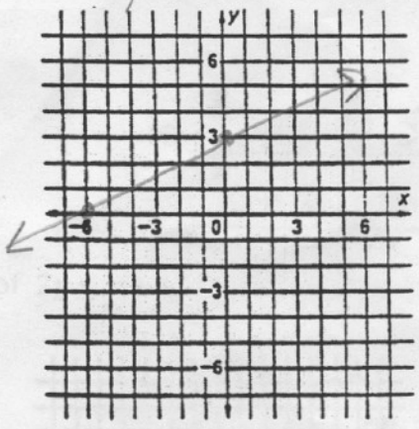
$-x + 2(0) = 6$

$\frac{-x}{-1} = \frac{6}{-1}$

$x = -6$

x-intercept = -6 (-6, 0)

y-intercept = 3 (0, 3)



11. Write the equation of a line with the given slope and y-intercept, in slope-intercept form if $m = -\frac{1}{7}, b = \frac{4}{9}$. (2 pts)

11. $y = -\frac{1}{7}x + \frac{4}{9}$

12. What is the slope and y-intercept of $3x + 2y = 5$? (2 pts)

$-3x \quad -3x$

$\frac{2y}{2} = \frac{-3x}{2} + \frac{5}{2}$

$y = -\frac{3}{2}x + \frac{5}{2}$

12. $m = -\frac{3}{2}$

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

12

13. Write the equation of the line, in slope-intercept form, that passes through the point (1,2) and has the same slope as the line $2x - 3y = 6$. (4 pts)

$-2x \quad -2x$

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

$y = \frac{2}{3}x - 2$

$y - 2 = \frac{2}{3}(x - 1)$

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

$+\frac{6}{3} \quad +\frac{6}{3}$

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

14. Find the equation of a line that passes through (-4, 2) and (8, -7). Write your answer in slope-intercept form. (4 pts)

$m = \frac{-7-2}{8-(-4)} = \frac{-9}{12} = \frac{-3}{4}$

$y - 2 = -\frac{3}{4}(x + (+4))$

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

$+2 \quad +2$

$y = -\frac{3}{4}x - 1$

14. $y = -\frac{3}{4}x - 1$

15. Peter has invested in two accounts. One account pays 5% annual interest and the other pays 6%. Peter has $200 more in the 6% account than the 5% account. If the total amount of interest was $47.86, how much does Peter have in each account? (4 pts)

$I = P_1 r_1 t_1 + P_2 r_2 t_2$

Let x = amt invested at 5%

$x + 200$ = amt invested at 6%

$47.86 = x(0.05) + (x+200)(0.06)$

$47.86 = 0.11x + 12$

$-12 \quad -12$

$\frac{35.86}{.11} = \frac{0.11x}{.11}$

$x = 326$

15. \$326 @ 5%

\$526 @ 6%

16. **Shade** the graph so that it represents the solution set of $2y \leq x + 4$. You must show your work. (2 pts)

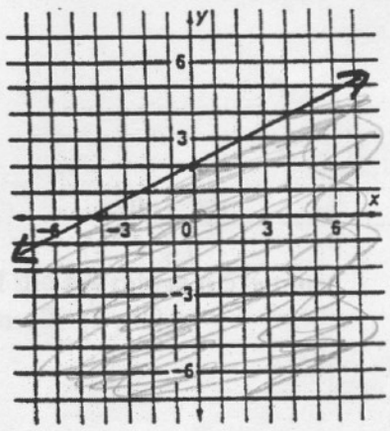
$\frac{2y}{2} \leq \frac{x}{2} + \frac{4}{2}$

$y \leq \frac{1}{2}x + 2$

test pt (0,0)

$2(0) \leq 0 + 4$

$0 \leq 4$ True



14

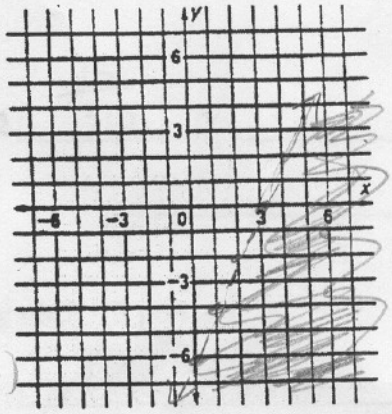
17. Graph $2x - y > 6$ (4 pts)

$-2x \quad -2x$

$-y > -2x + 6$

$-0 \quad -1 \quad -1$

$y < 2x - 6$



Test pt. $2(0) - 0 > 6$

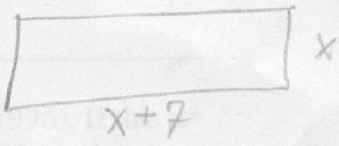
$0 > 6$ False

so do not shade by (0,0)

18. The length of a rectangle is 7 meters more than the width. If the perimeter is to be at least 52 m, what are the possible values for the width? (4 pts)

6 pts

Let $w = x$ & $l = x + 7$



$P \leq 2x + 2(x+7)$

$52 \leq 2x + 2x + 14$

$52 \leq 4x + 14$

$-14 \quad -14$

$\frac{38}{4} \leq \frac{4x}{4}$ → $\frac{19}{2}m \leq x$

18. 9.5m or more for the wi

19. The measures of the angles of a triangle are 3 consecutive *even* integers. Find the measure of each angle. (4 pts) Hint: 1st define each unknown

Let x = 1st angle, $x+2$ = 2nd angle, $x+4$ = 3rd angle

$x + x + 2 + x + 4 = 180°$

$3x + 6 = 180°$

$-6 \quad -6$

$\frac{3x}{3} = \frac{174°}{3}$

$x = 58°$, $x+2 = 60°$, $x+4 = 62°$

19. 58°, 60°, 62°

20. Solve for h if $V = \frac{1}{3}bh$ (2 pts)

$3 \cdot V = 3 \cdot \frac{1}{3}bh$

$\frac{3V}{b} = \frac{bh}{b}$

20. $h = \frac{3V}{b}$

21. Megan buys \$108.95 worth of clothing at West Acres, if the tax rate is 6.5% must be applied to all of her purchases, what is her total expense? (2 pts)

of

108.95

× 1.065

116.03175

21. # 116.03

16

22. Write the numerical expression for the phrase and then simplify.
The quotient of 15 and 30 is decreased by 2. (3 pts)

22. $\frac{15}{30} - 2$

$= \frac{1}{2} - 2$

$= \frac{1}{2} - \frac{4}{2} = -\frac{3}{2}$ or $\rightarrow -1\frac{1}{2}$

23. Is multiplication of fractions commutative? Why or why not? (3 pts)

Yes, as the order of multiplying the fractions does not make a difference in the product. ex. $\frac{1}{2} \cdot \frac{2}{3} = \frac{2}{3} \cdot \frac{1}{2}$

24. Each year 8 million Americans donate blood (according to a survry in 1996). If this ~~is~~ is 5% of those healthy enough to do so, how many Americans are eligible to donate blood? (3 pts)

Let X = # Americans eligible to donate

$\frac{.05 \cdot X}{.05} = \frac{8{,}000{,}000}{.05}$

$X = 160{,}000{,}000$

24. 160 million Americans

25. Evaluate $x^3 - 4x + 5$ when $x = -2$ (2 pts)

$(-2)^3 - 4(-2) + 5$

$-8 + 8 + 5$

$0 + 5$

25. 5

26. Define the variable and set up an equation for the following problem <u>do not solve.</u>
Kala gets paid \$7.00 an hour for the first 20 hrs/week and \$9.00 for each hour after that 20 hrs. How many hours must she work to earn \$200 for the week? (3 pts)

26. Let X = # hrs over 20 hrs

$200 = 7(20) + 9X$