KEY

Algebra 1 (cp) Midterm Review

Name: Date: Period:

Chapter 1

1. Evaluate the variable expression when $j = 4$.

$\frac{j}{44} = \frac{4}{44} \div 4 \div 4$

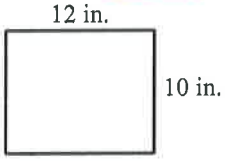
[1] 1/11

2. Evaluate the variable expression when $j = 4$.

$\frac{24}{j} = \frac{24}{4}$

[2] 6

3. Find the perimeter of the rectangle. Then find area.



Perimeter - Add the sides.
Don't forget units

$P = 12+12+10+10 = 44$

Perimeter

[3] 44in Area = 120in^2

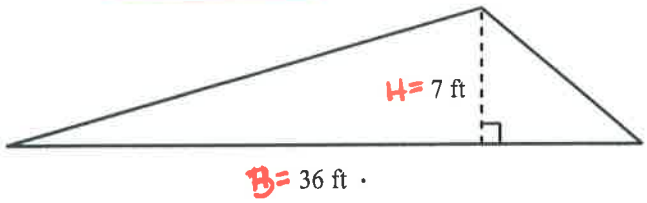
Area of a square or rectangle is length times width
Units are squared.

$A = l \cdot w = 12(10) = 120$

4. Find the area of the triangle.

Area = $\frac{1}{2}$ b · h

remember units^2



Area = $\frac{1}{2}(36)(7)$

$= 18(7)$

$= 126$

[4] 126 ft^2 or 126 SQ FT

5. Write the expression in exponential form.

$2 \cdot 2 \cdot 2$

X^Y

X = BASE

Y = EXPONENT

[5] 2^3

6. Complete the table.

EVALUATE POWER

Power in expanded form

Power	Base	Exponent	Standard Form
2^5	2	5	32
	3	4	
			125
r^8			

$= 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$

[6]

Power	Base	Exponent	Standard Form
2^5	2	5	32
3^4	3	4	81
5^3	5	3	125
r^8	R	8	r^8

$3 \cdot 3 \cdot 3 \cdot 3$

$5 \cdot 5 \cdot 5$

already simplified

7. Evaluate the expression for the given value of the variable.

x^3 when $x = 3$

$3^3 = 3 \cdot 3 = 9 \cdot 3 = 27$

[7] 27

8. Evaluate the expression for the given value of the variable.

$16 + 12x - x^3$ when $x = 3$

$16 + 12(3) - (3)^3 =$

$16 + 36 - 27 =$

$52 - 27 = 25$

[8] 25

9. Evaluate the expression for the given values of the variables.

$(c)^3 + (2g)^2$ when $c = 2$ and $g = 3$

$(2)^3 + (2 \cdot 3)^2 =$

$8 + (6)^2 =$

$8 + 36 = 44$

[9] 44

10. Evaluate the expression.

$6 \cdot 6 - 3$

$36 - 3 = 33$

[10] 33

11. Evaluate the expression.

$4 \cdot 3^2 - 5 =$

$4 \cdot 9 - 5 =$

$36 - 5 =$

31

[11] 31

12. Evaluate the expression.

$8 + 8 \cdot 2 - 10 \div 2$ =

$8 + 16 - 5 =$

$24 - 5 =$

(19)

[12] 19

13. Evaluate the expression for the given value of the variable.

$3y^2 \div 3 + 7$ when $y = 2$

$3(2)^2 \div 3 + 7 =$

$3(4) \div 3 + 7 =$

$12 \div 3 + 7 =$

$4 + 7 =$ (11)

[13] 11

14. Evaluate the expression for the given value of the variable.

$(y + 3)^2 - 40 \div 8$ when $y = 4$

$(4+3)^2 - 40 \div 8 =$

$(7)^2 - 5 =$

$49 - 5 =$

(44)

[14] 44

15. Evaluate the expression for the given value of the variable.

$[(y - 2)^2 + 5] \div 3$ when $y = 4$

$[(4-2)^2 + 5] \div 3 =$

$[2^2 + 5] \div 3 =$

$[4 + 5] \div 3 =$

$9 \div 3 =$ (3)

[15] 3

16. Evaluate the expression for the given value of the variable.

$[(y + 3)^2 - 9] \div 8$ when $y = 4$

$[(4+3)^2 - 9] \div 8 =$

$[7^2 - 9] \div 8 =$

$[49 - 9] \div 8 =$

$40 \div 8 =$

(5)

[16] 5

17. Evaluate the expression for the given values of the variables.

$\dfrac{45-1}{x+2y^2\cdot 2}$ when $x=6$ and $y=2$

$\dfrac{45-1}{6+2(2)^2\cdot 2} = \dfrac{44}{6+2\cdot 4\cdot 2} = \dfrac{44}{6+8\cdot 2} = \dfrac{44}{6+16} = \dfrac{44}{22} = 2$

[17] 2

18. Determine whether the following is an expression, an equation, or an inequality.

$2x^2-6x-1=3$

EXPRESSION IS A COLLECTIONS OF NUMBERS, VARIABLES, OPERATION + SYMBOLS OF INCLUSION.

EQUATION - 2 EXPRESSIONS CONNECTED WITH = SIGN

[18] EQUATION

INEQUALITY - 2 EXPRESSIONS CONNECTED WITH $<, \leq, >, \geq, \neq$

19. Check to see if $x=4$ is or is not a solution for the equation.

$2x+1=8+x\div 4$

IT'S A SOLUTION IF THE NUMBER CHECKS.

$2(4)+1=8+4\div 4$

$8+1=8+1$

$9=9$ ✓

[19] X=4 is a Solution

20. Check to see if $x=7$ is or is not a solution of the inequality.

$5+2x\leq 15$

IS A SOLUTION IF THE INEQUALITY IS TRUE.

$5+2(7)\leq 15$

$5+14\leq 15$

$19\leq 15$ (F)

[20] X=7 is NOT a Solution

21. Check to see if $x=2$ is or is not a solution of the inequality.

$7+3x\leq 7x-2$

$7+3(2)\leq 7(2)-2$

$7+6\leq 14-2$

$13\leq 12$ (F)

[21] X=2 is NOT a Solution

22. Check to see if $x = 2$ is or is not a solution of the inequality.
$5x - 2 \geq 7$

$5(2) - 2 \geq 7$
$10 - 2 \geq 7$
$8 \geq 7$ (T)

[22] X=2 is a solution

23. Does the input-output table represent a function? If it does represent a function, list the domain and range.

X → y →

Input	2	3	4	5
Output	12	15	18	21

← THIS IS A FUNCTION BECAUSE THERE ARE NO REPEATING X-VALUES

DOMAIN: X = 2, 3, 4, 5
RANGE: Y = 12, 15, 18, 21

Domain is a list of x-values
Range is a list of the y-values

[23]

24. Does the input-output table represent a function? If it does represent a function, list the domain and range. If it does not represent a function, explain why.

X →

Input	0	2	4	4	6
Output	1	4	7	10	13

NOT A FUNCTION
BECAUSE THERE ARE REPEATING X-VALUES

[24]

25. Make a table of values for the line $y = 2x + 1$ using x-values of 1, 2, 3, 4, and 5. Graph the line.

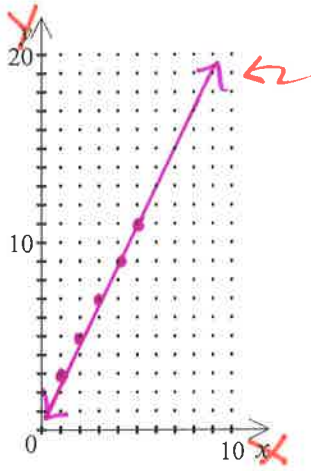
f(x) is the same as "y"

$y = 2x + 1$

$\Updownarrow$

$f(x) = 2x + 1$

x	1	2	3	4	5
$f(x)$	3	5	7	9	11

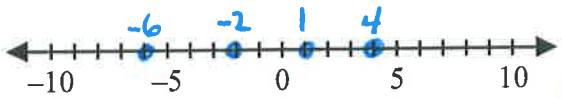


remember arrows

[25]

Chapter 2

26. Graph –2, 4, –6, and 1 on a number line and determine the order of the numbers.



[26] -6, -2, 1, 4

27. Write the numbers in increasing order.

$\frac{3}{2}$, –10, 0, $\frac{2}{3}$, $-\frac{5}{4}$, 1

TIP: CHANGE FRACTIONS TO DECIMALS

1.5 .66 -1.25

[27] $-10, -\frac{5}{4}, 0, 1, \frac{3}{2}$

28. What is the opposite of 15?

OPPOSITE: MEANS TO SWITCH THE SIGN

RECIPROCAL: FLIP FRACTION KEEP SIGN

EXAMPLE: $-3/4 \longrightarrow$ reciprocal is $-4/3$

[28] -15

29. Solve the equation.

$|x| = 8$

$x = 8, -8$

ABSOLUTE VALUE IS THE DISTANCE FROM 0.

EX] $|-8| = 8$ EX] $|5| = 5$ EX] $|0| = 0$

C: $x = 8$ $|8| = 8$ $8 = 8$ ✓

C: $x = -8$ $|-8| = 8$ $8 = 8$ ✓

[29] $x = 8, -8$ OR $x = \pm 8$

30. Use the properties of addition to find the sum.

$(-7) + 6 + [-(2 - 3)]$

take the opposite $-(\ )$ This means take the opposite of everything in the ( )'s

$-7 + 6 [-(-1)] =$

$-7 + 6[1] =$

$-7 + 6 = -1$

[30] -1

31. Find the difference.

$(-8)-(-2)$

$-8+2=-6$

[31] -6

32. Find the terms of the expression.

$-3-4x$

TERMS ARE SEPERATED BY ADDITION AND SUBTRACTION SIGNS.

[32] $-4x, -3$

33. Find the product.

$-3(-2)$

FACTORS ARE SEPERATED BY MULT. SIGNS

THIS EXAMPLE HAS 2 FACTORS: $-3, -2$

[33] 6

34. Find the product.

$(-2)^4$

$-2 \cdot -2 \cdot -2 \cdot -2 = 16$

$(-2)^4 = +16$ "EVEN" NUMBER OF NEGATIVE FACTORS IS POSITIVE.

$(-2)^3 = -8$ "ODD" NUMBER OF NEGATIVE FACTORS IS NEGATIVE.

[34] 16

35. Simplify the expression.

$-2(-5)(k)$

3 FACTORS: $-2, -5, K$

$-2 \cdot -5 = 10$

[35] $10K$

36. Determine whether the statement is *true* or *false*. If it is false, give a counterexample. The product $0 \cdot (n)$ is always 0.

TRUE - ANY NUMBER TIMES ZERO IS ZERO.

[36] _____

37. Evaluate the expression for the given value of the variable.

$-4[X+5] - 10 * X / 2 + 30$ when $X = -5$

remember Use ()'s when substituting negative numbers.

$-4[(-5)+5] - 10(-5)/2 + 30 =$

$-4(0) + 50/2 + 30 =$

$0 + 25 + 30 = 55$

[37] 55

38. Use the Distributive Property to rewrite the expression without parentheses.

$17x(3x - 5) =$

Remember $X \cdot X = X^2$

$(17x)(3x) + (17x)(-5) =$

$51x^2 + -85x$

2 TERMS: $51x^2, -85x$

[38] $51x^2 - 85x$

39. List the like terms in the expression.

$-11k - 3j^2 + 6j + 4j + 8j^2 + 7k$

Like terms have the same variables raised to the same exponents.

[39] $-3j^2$ and $8j^2$; $4j$ and $6j$; $-11k$ and $7k$

40. Simplify the expression.

$8x + 6 + 4x - 4$

Combine $8x + 4x$

Combine numbers $6 + -4$

[40] $12x + 2$

41. Simplify the expression.

$3x + 7 - 3x + 4$ = 7 + 4 = (11)

$3x + -3x = 0$

[41] 11

42. Simplify the expression.

$7x + 4(x + 3)$

$7x + 4x + 12$ = $11x + 12$

[42] _____

remember order of operations 1ST MULTIPLY THEN ADD

43. Simplify the expression.

$90 - 15(x + 1) + 5(x + 1)$

$90 - 15x - 15 + 5x + 5$

$-10x + 80$

[43] _____

① Combine variable terms $-15x + 5x$

② Combine numbers $90 + 15 +$

③ order correctly

- Variable terms either H → L exponents or ABC order
- number last

44. Find the quotient.

$40 \div (-5)$

[44] −8

45. Evaluate the expression for the given value(s) of the variable(s).

$\frac{v - 12}{4}$ when $v = 20$

$\frac{20 - 12}{4} = \frac{8}{4} = (2)$

[45] 2

46. Evaluate the expression for the given value(s) of the variable(s).

$\frac{x}{y}$ when $x = 20$ and $y = -5$

$\frac{20}{-5} = -4$

[46] -4

47. Simplify the expression.

$\frac{42f - 24}{6} = \frac{42F}{6} - \frac{24}{6} =$

$7F - 4$

[47] $7F-4$

48. Simplify the expression.

$\frac{28x - 14}{7} = \frac{28x}{7} + \frac{-14}{7} =$

$4x - 2$

[48] $4x-2$

ALWAYS CHECK!!

Chapter 3

49. Solve the equation.

$\frac{4}{5}\cdot\frac{5}{4}x = 40 \cdot \frac{4}{5}$

mult by the reciprocal

$x = \frac{40}{1}\cdot\frac{4}{5}$

$x = 32$

C: $\frac{5}{4}\cdot\frac{32}{1} = 40$

$40 = 40$ ✓

[49] $x = 32$

50. Solve the equation.

$\frac{x}{5} = 3 \cdot 5$

$x = 15$

C: $\frac{15}{5} = 3$

$3 = 3$ ✓

[50] $x = 15$

51. Solve the equation.

$4x + 8 = 21$

$-8 \quad -8$

$\frac{4x}{4} = \frac{13}{4}$

$x = \frac{13}{4}$

C: $\frac{1}{4}\left(\frac{13}{4}\right) + 8 = 21$

$13 + 8 = 21$

$21 = 21$ ✓

[51] $x = \frac{13}{4}$ or $x = 3\frac{1}{3}$

52. Solve the equation.

$2x - |-5| = 23$

Absolute value $|-5| = 5$

$2x - 5 = 23$

$+5 \quad +5$

$\frac{2x}{2} = \frac{28}{2}$

$x = 14$

C: $2(14) - |-5| = 23$

$28 - 5 = 23$

$23 = 23$ ✓

[52] $x = 14$

ALWAYS SIMPLIFY BOTH SIDES FIRST!!

53. Solve the equation.

$2n+18-4n=34$

$-2N+18=34$

$-18 \quad -18$

$\frac{-2N}{-2}=\frac{16}{-2}$

$N=-8$

C: $2(-8)+18-4(-8)=34$

$-16+18+32=34$

$34=34$ ✓

[53] $N=-8$

54. Solve the equation.

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

$5N-2N+4=-11$

$3N+4=-11$

$-4 \quad -4$

$\frac{3N}{3}=\frac{-15}{3}$

$N=-5$

C: $5(-5)-2(-5-2)=-11$

$-25-2(-7)=-11$

$-25+14=-11$

$-11=-11$ ✓

[54] $N=-5$

55. Solve the equation.

$\frac{8}{18}y-40=0$

$+40 \quad +40$

$\frac{18}{8}\cdot\frac{8}{18}y=40\left(\frac{18}{8}\right)$

$y=90$

C: $\frac{8}{18}\left(\frac{90}{1}\right)-40=0$

$40-40=0$

$0=0$ ✓

[55] $y=90$

56. Solve the equation.

$-\frac{21x}{7}-5x=24$

$-3x-5x=24$

$\frac{-8x}{-8}=\frac{24}{-8}$

$x=-3$

C: $\frac{-21(-3)}{7}-5(-3)=24$

$\frac{63}{7}+15=24$

$9+15=24$

$24=24$ ✓

[56] $x=-3$

57. Solve the equation.

$6z+3=8z-5$

$-6z \quad -6z$

$3=2z-5$

$+5 \quad +5$

$\frac{8}{2}=\frac{2z}{2}$

$z=4$

C: $6(4)+3=8(4)-5$

$24+3=32-5$

$27=27$ ✓

[57] $z=4$

58. Solve the equation.

$5x+14-2x=9-(4x+2)$

DISTRIBUTE (-1)

$3x+14=9-4x-2$

$3x+14=-4x+7$

$+4x \quad +4x$

$7x+14=7$

$-14 \quad -14$

$\frac{7x}{7}=\frac{-7}{7} \rightarrow x=-1$

C: $5(-1)+14-2(-1)=9-[4(-1)+2]$

$-5+14+2=9-[-4+2]$

$-5+16=9-[-2]$

$11=9+2$

$11=11$ ✓

[58] $x=-1$

59. Solve the equation.

$7z+5=9z-3$

$-7z \quad -7z$

$5=2z-3$

$+3 \quad +3$

$\frac{8}{2}=\frac{2z}{2}$

$z=4$

C: $7(4)+5=9(4)-3$

$28+5=36-3$

$33=33$ ✓

[59] $z=4$

60. Solve the equation.

$4+3(x-1)=2(x-2)$

$4+3x-3=2x-4$

$3x+1=2x-4$

$-2x \quad -2x$

$x+1=-4$

$-1 \quad -1$

$x=-5$

C: $4+3(-5+-1)=2(-5+-2)$

$4+3(-6)=2(-7)$

$4+-18=-14$

$-14=-14$ ✓

[60] $x=-5$

61. Solve the equation.

$\frac{1}{4}(4x+16)=3+2(2-x)$

$x+4=3+4-2x$

$x+4=-2x+7$

$+2x \quad +2x$

$3x+4=7$

$-4 \quad -4$

$3x=3$

$\frac{3x}{3}=\frac{3}{3}$

$x=1$

C: $\frac{1}{4}[4(1)+16]=3+2(2-1)$

$\frac{1}{4}[4+16]=3+2(1)$

$\frac{1}{4}[20]=3+2$

$5=5$ ✓

[61] $x=1$

Special Cases

NO SOLUTION is when the variable drops out and the numbers left do not EQUAL.

ALL REAL NUMBERS is when the variables drop out and the numbers EQUAL.

64. Rewrite the equation in function form. $y = mx + b$

$-4x + y = 16$

$+4x \quad +4x$

[64] $y = 4x + 16$

65. Find four solutions of $2x + y = 7$.

$-2x \quad -2x$

$y = -2x + 7$

x	y
-1	9
0	7
1	5
2	3

[65]

66. Complete the table. Then graph the equation.

x	-4	-2	0	2	4
$y = \frac{1}{2}x - 4$					

PICK EASY x's For fractions, use multiples of the denominator

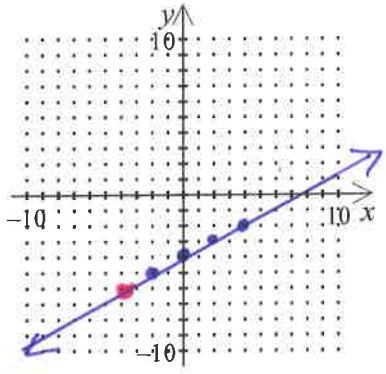
$y = \frac{1}{2}(-2) - 4 = -1 + -4$

$y = \frac{1}{2}(0) - 4 = -4$

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

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

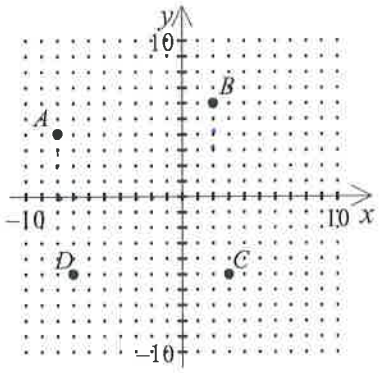
x	-4	-2	0	2	4
$y = \frac{1}{2}x - 4$	-6	-5	-4	-3	-2



[66]

Chapter 4

62. Write the ordered pairs that correspond to the given points.



A (−8, 4)

B (2, 6)

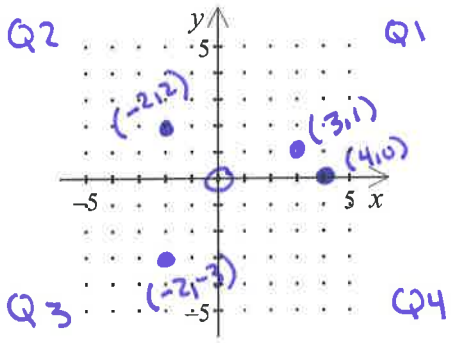
D (−7, 5)

C (3, −5)

[62] _____

63. Plot the given points in a coordinate plane.
(4, 0), (–2, –3), (3, 1), and (–2, 2)

X-axis Q3 Q1 Q2

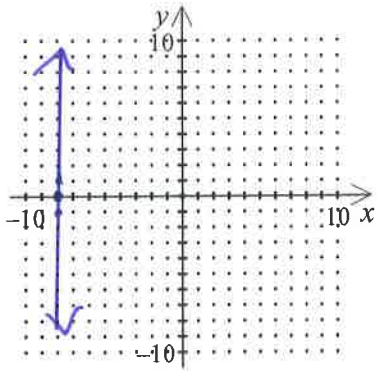


[63] _____

67. Graph the equation.

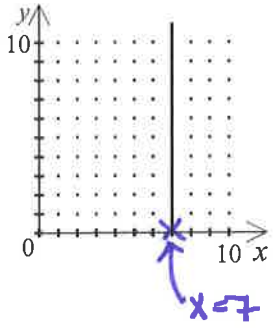
$x = -8$

x	y
-8	-1
-8	0
-8	1



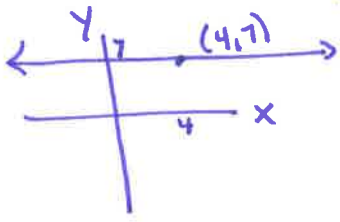
[67] _____

68. Write the equation for this graph.



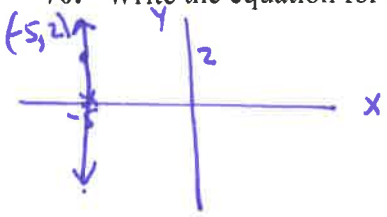
[68] x=7

69. Write the equation of the horizontal line passing through the point (4, 7).



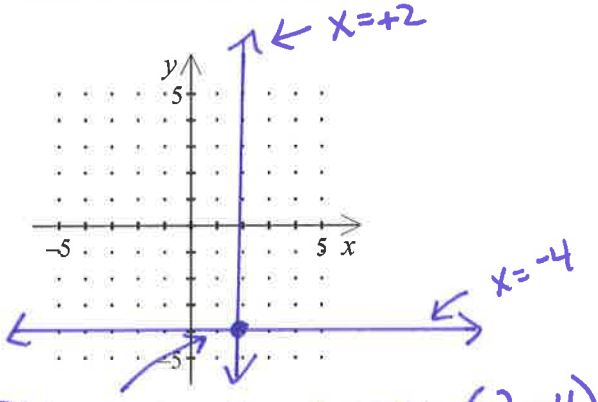
[69] y=7

70. Write the equation for the vertical line passing through the point (–5, 2).



[70] $x = -5$

71. Sketch the graphs of $x = +2$ and $y = -4$. Find the point at which the two graphs intersect.



[71] POINT OF INTERSECTION $(2, -4)$

72. Find the x-intercept of the line $3x - y = -3$.

X INTERCEPT, SET $y = 0$
ordered pair $(x, 0)$

$3x - 0 = -3$

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

$x = -1$

[72] $x = -1$ or $(-1, 0)$

73. Find the x- and y-intercepts of the line $3x + 4y = -12$.

Y intercept, SET $x = 0$
ordered pair $(0, y)$

[73] XINT $(-4, 0)$ YINT $(0, -3)$

$3x + 4y = -12$

XINT

$3x + 4(0) = -12$

$\frac{3x}{3} = \frac{-12}{3}$

$x = -4$

Y INT

$3(0) + 4y = -12$

$\frac{4y}{4} = \frac{-12}{4}$

$y = -3$

74. Graph the linear equation by finding the x- and y-intercepts.
$2x - y = -2$

X INT

$2x - 0 = -2$

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

$x = -1$

$(-1, 0)$

Y INT

$2(0) - y = -2$

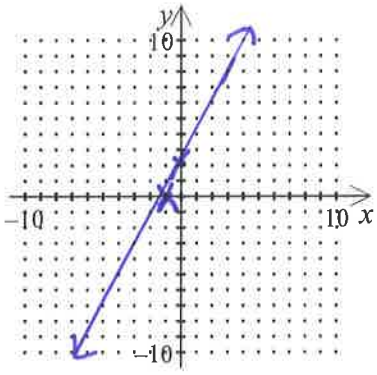
$-y = -2$

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

$y = 2$

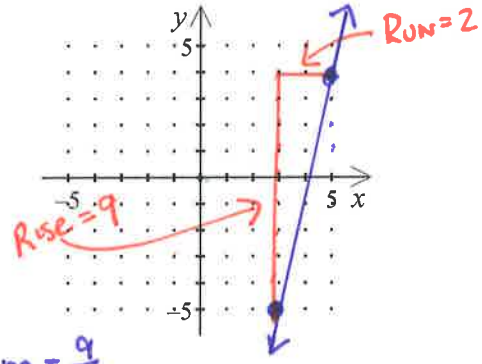
$(0, 2)$

[74]



75. Plot the points and find the slope of the line passing through the points (3, –5) and (5, 4).

$m = \frac{\text{RISE}}{\text{RUN}}$



[75] $m = \frac{9}{2}$

76. Find the slope of the line passing through the points $A(-2, 9)$ and $B(1, -3)$.

$M = \frac{y_2 - y_1}{x_2 - x_1} = \frac{\Delta y}{\Delta x}$

[76] $m = -4$

$m = \frac{9 - (-3)}{-2 - 1} = \frac{9 + 3}{-3} = \frac{12}{-3}$

$M = -4$

$M = \frac{\Delta y}{\Delta x}$

77. Find the slope of the line that contains (–4, –3) and (–3, –3).

$m = \frac{-3-(-3)}{-4-(-3)} = \frac{-3+3}{-4+3} = \frac{0}{-1}$

[77] $M = 0$

78. Find the slope of the line through the points (·1, –3) and (–1, 7).

$M = \frac{-3-7}{1-(-1)} = \frac{-10}{1+1} = \frac{-10}{2}$

[78] $m = -5$

79. Find the slope of the line through the points (4, 7) and (–6, 2).

$M = \frac{7-2}{4-(-6)} = \frac{5}{10}$ ← reduce

[79] $M = \frac{1}{2}$

80. Give the slope of the line that contains (6, 4) and (6, 6).

$M = \frac{4-6}{6-6} = \frac{-2}{0}$

[80] M = undefined

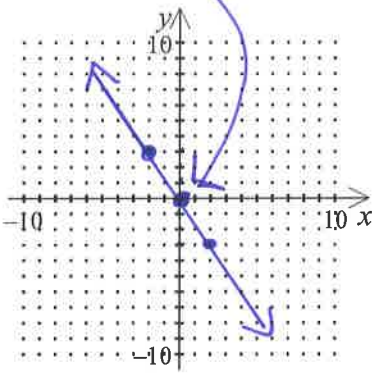
$y = mx + b$

$m = \frac{\text{Rise}}{\text{Run}}$ $\quad$ y-intercept

81. Graph the equation $y = -\frac{3}{2}x$.

$+0$ ← y-intercept = 0

$m = \frac{-3}{2} = \frac{\text{Rise}}{\text{Run}}$



[81]

82. Rewrite the equation in slope-intercept form.

$8x - 3y - 5 = 0$

$-8x \quad +5 \quad -8x + 5$

$\frac{-3y}{-3} = \frac{-8x+5}{-3} \quad \frac{}{-3}$

[82] $y = \frac{8}{3}x - \frac{5}{3}$

83. Find the slope and y-intercept of the line. — PUT IN $y = mx + b$

$6x - 3y = 54$

$-6x \quad -6x$

$\frac{-3y}{-3} = \frac{-6x+54}{-3} \quad \frac{}{-3}$

$y = 2x - 18$

[83] $m = 2 \qquad b = -18$

84. Solve for y.

$4x - 5y = 0$

$-4x \quad -4x$

$\frac{-5y}{-5} = \frac{-4x}{-5}$

[84] $y = \frac{4}{5}x$

85. Write in slope-intercept form and sketch the line.

$3x - y - 2 = 0$

$-3x \quad -3x$

$-y - 2 = -3x$

$+2 \quad +2$

$-y = -3x + 2$

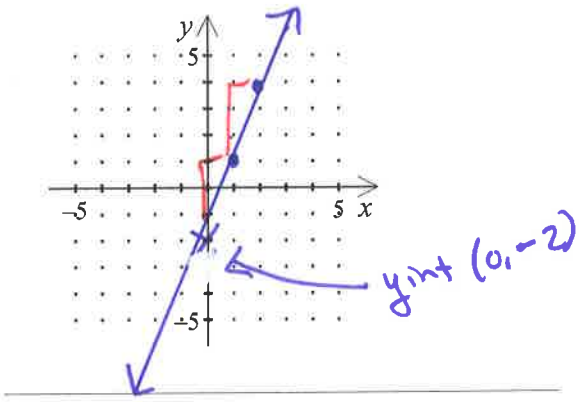
$\frac{-y}{-1} = \frac{-3x}{-1} + \frac{2}{-1}$

$y = 3x - 2$

$m = 3/1$

$b = -2$

[85]



// lines have the same slope

Chapter 5

86. Solve for y in $6x+2y=3$. Determine if the line is parallel to $y=-\frac{7}{2}x-\frac{5}{8}$.

$-6x \quad -6x$

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

$y = -3x + 3/2$

$M = -3$

$m = -7/2$

[86] The lines are not // because the lines have different slopes.

87. Find the slope and y-intercept of the line $y=5x+4$. Is the line parallel to $y=\frac{1}{5}x+4$?

$y = mx + b$

$m = 1/5$

M = slope

b = y intercept

[87] $m=5$ $b=4$ NOT // - different slopes

88. Find the slope and y-intercept of the line $y=18x-1$. Is the line parallel to $y=18x-10$?

$m=18$

[88] $m=18$ $b=-1$ lines are // because the slopes are the same

89. Is the relation $\{(-1,-3),(-1,2),(2,-4)\}$ a function?

X X X

[89] NOT A function because there are repeating X-values (-1)

FUNCTIONS: DO NOT HAVE REPEATING X-values
The values of Y do not matter

90. Decide whether the information defines a function. If it does, state the domain of the function.

X →

input	0	1	2	3	4
output	1	2	3	2	1

[90] FUNCTION – NO REPEATING X-VALUES

91. Find $f(-2)$ given $f(x) = 3x^2 + 2x + 10$. ← Substitute x with -2

$f(-2) = 3(-2)^2 + 2(-2) + 10$

$= 3(4) + -4 + 10$

$= 12 + -4 + 10$

$= -4 + 22$

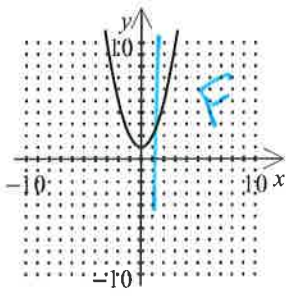
$f(1) = 3(1)^2 + 2(1) + 10$

$f(0) = 3(0)^2 + 2(0) + 10$

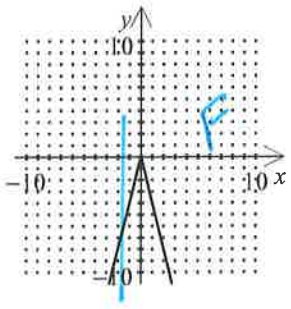
[91] $f(-2) = 18$ $f(1) = 15$ $f(0) = 10$

92. Determine which of the following graphs does *not* represent a function.

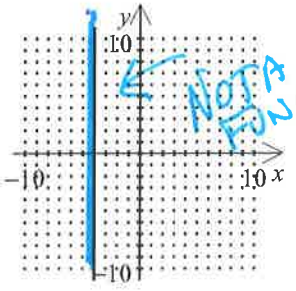
[A]



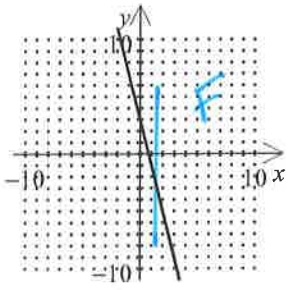
[B]



[C]



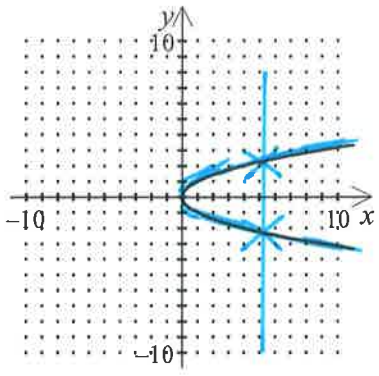
[D]



Vertical Line test – Draw Vertical line(s)
IF You can draw a V-Line that touches the graph more than ONCE then it is NOT a function

[92] C

93. Determine whether the following graph represents a function.



[93] NOT A FUNCTION

BECAUSE THE VERTICAL LINE TOUCHES THE GRAPH MORE THAN ONCE

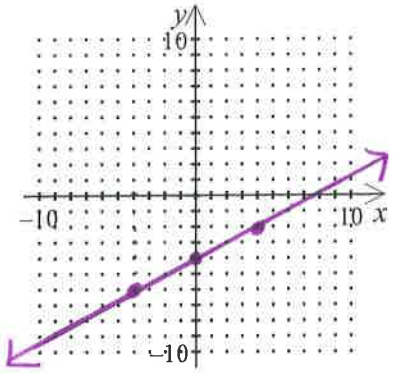
94. Complete the function table. Then graph the function.

x	$y = f(x) = \frac{1}{2}x - 4$	
-4	-6	$\frac{1}{2}(-4) - 4 = -2 - 4 = -6$
0	-4	
4	-2	$\frac{1}{2}(4) - 4 = 2 - 4 = -2$

Domain (↑ x column) Range (↑ y column)

Domain are the x values.

Range are the y values



[94] Range $y = -6, -4, -2$

95. Write in slope-intercept form the equation of a line having slope -7 and y-intercept 7.

$y = mx + b$ (m = slope, b = y-intercept)

[95] $y = -7x + 7$

96. Write an equation of the line with slope $-\frac{3}{2}$ and y-intercept -5.

$m = -\frac{3}{2}$ $b = -5$

[96] $y = -\frac{3}{2}x - 5$

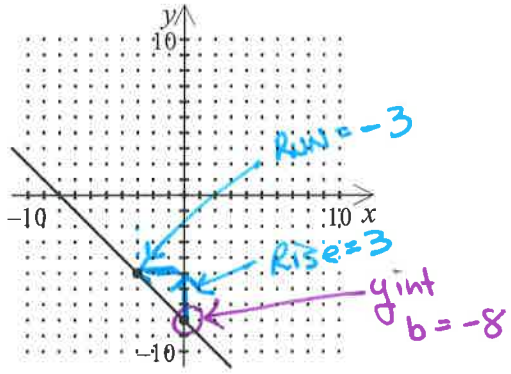
$y = mx + b$

97. Write in slope-intercept form the equation of the line.

$m = \frac{2}{3}$, $b = 4$

[97] $y = \frac{2}{3}x + 4$

98. Write an equation of the line shown in slope-intercept form.



① FIND y intercept (b)

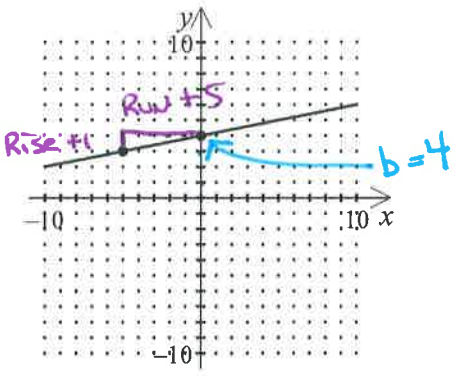
② FIND THE Slope

$m = \frac{\text{Rise}}{\text{Run}}$

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

[98] $y = -x - 3$ OR $y = -1x - 3$

99. Write an equation of the line shown in slope-intercept form.



$m = \frac{\text{Rise}}{\text{Run}} = \frac{1}{5}$

[99] $y = \frac{1}{5}x + 4$

100. Write an equation in point-slope form of the line. Then rewrite the equation in slope-intercept form.

$\rightarrow y - y_1 = m(x - x_1)$ where (x_1, y_1) is a point. remember to take opposite of $x_1, +y_1$

The line that passes through the point $(-2, 3)$ and has the slope $\frac{2}{3}$.

x_1 y_1

P/S $y - y_1 = m(x - x_1)$

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

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

S/I $y - 4 = \frac{2}{3}x + \frac{2}{3} \cdot \frac{2}{1}$

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

$+4 \quad +4$

[100] P/S : $y - 4 = \frac{2}{3}(x + 2)$

S/I : $y = \frac{2}{3}x + 6$

101. Use the point-slope form to write an equation of the line that passes through the given point and has the given slope.

$(-7, 1)$, $m = \frac{1}{2}$

x_1, y_1

$y - y_1 = m(x - x_1)$

$y - 1 = \frac{1}{2}(x - (-7))$

[101] $y - 1 = \frac{1}{2}(x + 7)$

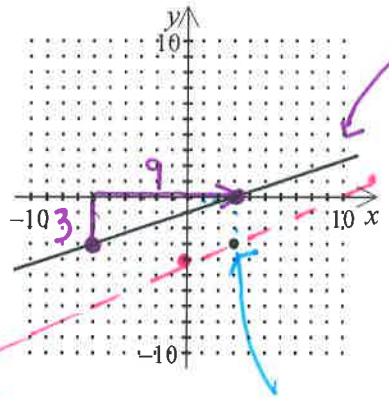
102. Use the point-slope form to write an equation of the line that passes through the given point and has the given slope.

$(5, -7)$, $m = \frac{3}{5}$ $\quad y - (-7) = \frac{3}{5}(x - 5)$

x_1, y_1

[102] P/S $\quad y + 7 = \frac{3}{5}(x - 5)$

103. Write in slope-intercept form the equation of the line that is parallel to the line in the graph and passes through the given point.



STEP 1 FIND Slope of Given line

$m = \frac{\text{Rise}}{\text{Run}} = \frac{3}{9}$ $\quad M = \frac{1}{3}$

STEP 2 Use the $\parallel m$ (same slope) and pt

P/S $y - (-3) = \frac{1}{3}(x - 3)$

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

STEP 3 PUT IN S/I $y = mx + b$

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

$-3 \quad\quad -3$

[103] S/I $\quad y = \frac{1}{3}x - 4$

$\parallel m = \frac{1}{3}$ pt $(3, -3)$

Check by graphing. lines are $\parallel$.

104. Write an equation for the line containing $(-5, -18)$ and $(-6, -23)$.

STEP 1 FIND Slope

$m = \frac{\Delta y}{\Delta x} = \frac{-18 + 23}{-5 + 6} = \frac{5}{1}$

$m = 5$

$(-5, -18)$ $\quad y + 18 = 5(x + 5)$ or

[104] $(-6, -23)$ $\quad y + 23 = 5(x + 6)$

STEP 2 Pick either pt. There are 2 answers

$y - y_1 = m(x - x_1)$

NOTE: IF You PUT EITHER P/S EQUATION INTO S/I The S/I will be the same

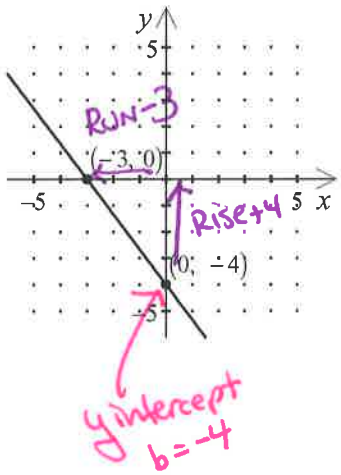
S/I $y = 5x + 7$

105. Write in point-slope form the equation of the line that passes through the points (4, –4) and (3, 1). Use (4, –4) as the point (x_1, y_1).

STEP I: $m = \frac{\Delta y}{\Delta x} = \frac{-4-1}{4-3} = \frac{-5}{1}$ $m = -5$

STEP II p/s $y + 4 = -5(x - 4)$ [105] p/s $y + 4 = -5(x - 4)$

106. Write an equation of the line shown on the graph.



STEP I: FIND Y-INTERCEPT (b)

STEP II FIND Slope

$m = \frac{\text{RISE}}{\text{RUN}} = \frac{4}{-3}$

Remember Negative fractions can be written either $\frac{4}{-3} = \frac{-4}{3} = -\frac{4}{3}$

[106] $y = -\frac{4}{3}x - 4$

107. Write the equation of the line in slope-intercept form that passes through the given points. (–3, 5) and (2, –5)

STEP I FIND Slope

$m = \frac{5+5}{-3-2} = \frac{10}{-5}$ $m = -2$

[107] $y = -2x - 1$

STEP II Pick either point and find the p/s EQUATION. I did both

pt (-3, 5) p/s $y - 5 = -2(x + 3)$

pt (2, -5) p/s $y + 5 = -2(x - 2)$

STEP III PUT IN Slope INTERCEPT

$y - 5 = -2x - 6$ (+5 +5)

s/I $y = -2x - 1$

$y + 5 = -2x + 4$ (-5 -5)

s/I $y = -2x - 1$

NOTICE THEY ARE THE SAME

STANDARD FORM: $Ax+By=C$ where A, B, C are integers

integers do NOT have decimals or fractions

108. Write the equation of the line in standard form. Use integer coefficients.

$y=-\frac{4}{7}x-\frac{2}{7}$

$+\frac{4}{7}x \quad +\frac{4}{7}x$

$7\left[\frac{4}{7}x+y=-\frac{2}{7}\right]$

$4x+7y=-2$

← STEP 1: Get x and y terms on the left and constant on the right

STEP 2: MULTIPLY THE ENTIRE EQUATION TO ELIMINATE FRACTIONS

[108] 2 possible answers: $4x+7y=-2$ or $-4x-7y=2$

109. Write the equation of the line in standard form. Use integer coefficients.

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

$-\frac{2}{3}x \quad -\frac{2}{3}x$

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

$-2x+3y=-12$

[109] $-2x+3y=-12$

110. Determine whether the lines are perpendicular.

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

$m=4 \qquad m=-4$

(1) Perpendicular slopes are Negative Reciprocals

① They have opposite signs

② The fractions are reciprocals

[110] NOT ⊥, the slopes are NOT negative reciprocals

111. Determine whether the lines are perpendicular.

$y=\frac{1}{2}x-7,\ y=-2x+10$

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

- slopes are opposite SIGNS
- fractions are reciprocals

[111] lines are ⊥, the slopes are negative reciprocals

112. Find the slope of a line perpendicular to the line $y=-4x+3$.

$m=-4$

$\perp m=+1/4$

[112]

Examples of reciprocals

$-5 \longrightarrow -1/5$

$-1/2 \longrightarrow -2$

$-3/4 \longrightarrow -4/3$

$-5/2 \longrightarrow -2/5$