Equations and Inequalities

1) $4x - 5 < 2x + 11$

$-2x \quad -2x$

$2x - 5 < 11$

$+5 \quad +5$

$2x < 16$

$\boxed{x < 8}$

2) $2x + 4(7x - 3) - 8 = 5x - 30$

$2x + 28x - 12 - 8 = 5x - 30$

$30x - 20 = 5x - 30$

$-5x \quad -5x$

$25x - 20 = -30$

$25x = -10$

$\boxed{x = -10/25 = -0.4}$

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3) $-5x - 2x \geq 35.$

$-7x \geq 35$

$-7 \quad -7$

$\boxed{x \leq -5}$

4) $-8x - 16 = -8(2x - 6)$

$-8x - 16 = -16x + 48$

$+16x \quad +16x$

$8x - 16 = 48$

$8x = 64$

$\boxed{x = 8}$

5) $3x - 5 > 4x + 6$

$-3x \quad -3x$

$-5 > x + 6$

$-6 \quad -6$

$-11 > x$

$\boxed{x < -11}$

Literal Equations

1) For **y in terms of x**: $-12x + 4y = -8$

$+12x \quad +12x$

$\frac{4y}{4} = \frac{12x}{4} - \frac{8}{4}$

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

2) **W**: $P = 2(L + W)$

$\frac{P}{2} = L + W$

$\boxed{\frac{P}{2} - L = W}$

3) For **a**: $ax + by = c$

$-by \quad -by$

$\frac{ax}{x} = \frac{c - by}{x}$

$\boxed{a = \frac{c - by}{x}}$

4) For t: $m^2 \cdot P = \frac{t}{m^2} \cdot m^2$

$\boxed{m^2 P = t}$

5) For z $2m = \frac{z(b+x)}{2} \cdot 2$

$\frac{2m}{b+x} = \frac{z(b+x)}{b+x}$

$\boxed{z = \frac{2m}{b+x}}$

Properties of Equality

Match the properties with the example that goes with it.

B 1. Commutative Property

D 2. Associative Property

E 3. Symmetric Property of Equality

A 4. Transitive Property of Equality

C 5. Identity Property

A. If a = b and b = c, then a = c

B. 2 x 8 x 3 = 2 x 3 x 8

C. 22a + 0 = 22a

D. (4 + 9) + 5 = 4 + (9 + 5)

E. If a = b, then b = a

6)

Equation	Steps
3(x – 2) + 10 = 25	Original Equation
3x – 6 + 10 = 25	6. Distributive Property
3x + 4 = 25	7. Associative – Combine Like Terms
3x = 21	8. Subtraction POE
x = 7	9. Div POE

Word Problems

1) Sara wants to have an average of at least 90 on her tests. If she took three tests and earned an 84, 95, and 82, what is the lowest grade she has to earn on the fourth test?

$4 \cdot \frac{84+95+82+x}{4} \geq 90 \cdot 4$

$261 + x \geq 360$

$\boxed{x \geq 99}$

2) Seth wants an average of no lower than an 85 on his tests. He has taken 3 tests. On the first test he made an 80, and on the 2nd and 3rd test he made the same score. What is the lowest grade Seth has to make on both of those tests to make his average?

$3 \cdot \frac{2x+80}{3} \geq 85 \cdot 3$

$2x + 80 \geq 255$

$2x \geq 175$

$\boxed{x \geq 87.5}$

* choose an answer choice that is greater

3) Lola travelled to New York to visit her grandmother. When she arrived at the airport she had to take a taxi to her grandmother's house. The sign says the cost for the taxi is $5.00 plus .20 a mile. Create and equation that models the situation. State what x and y represent in your equation.

$y = .20x + 5$ → initial amt

y: total cost of ride; .20: cost per mile; x: # of miles

4) Jordan is trying to find the sum of 3 consecutive **odd** integers. Their sum is 249. Find the 3 numbers. Show all work.

$x + (x+2) + (x+4) = 249$

$3x + 6 = 249$

$3x = 243$

$\boxed{x = 81}$

81, 83, 85

5) The width of a rectangle is 4 inches more than the length. The perimeter is 56 inches. Find the length and width of the rectangle. You must show your algebraic equation and work to get credit!

$W = 4 + L$

$P = 2L + 2W$

$56 = 2L + 2(4 + L)$

$56 = 2L + 8 + 2L$

$56 = 4L + 8$

$48 = 4L$

$\boxed{12 = L \text{ inches}}$

$\boxed{W = 16 \text{ inches}}$

Characteristics of Linear Functions Practice Worksheet A

Name_____ **Date**_____

1. X Domain: $(-\infty, \infty)$ y Range: $(-\infty, \infty)$

X x – intercept: $(6, 0)$ y y – intercept: $(0, 3)$

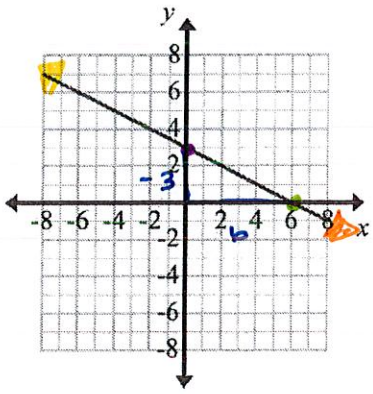
X Increasing: X Decreasing: ✓ $(-\infty, \infty)$

~~Constant:~~ Slope: $-1/2$

End Behavior: As x → + ∞, f(x) → $-\infty$

As x → – ∞, f(x) → ∞

Equation: $y = -1/2x + 3$



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

2. X Domain: $(-\infty, \infty)$ y Range: $(-\infty, \infty)$

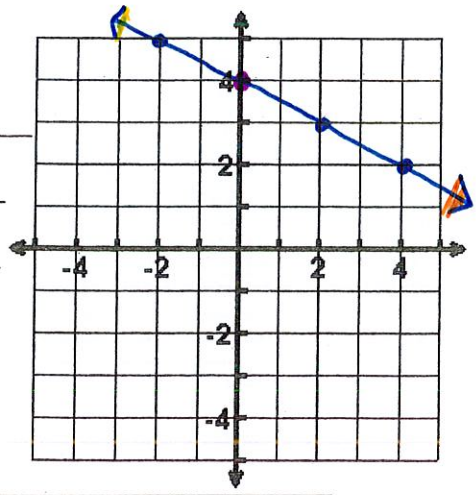
X x – intercept: _____ y – intercept: $(0, 4)$

X Increasing: X Decreasing: ✓ $(-\infty, \infty)$

~~Constant:~~ Slope: $-1/2$

End Behavior: As x → + ∞, f(x) → $-\infty$

As x → – ∞, f(x) → ∞



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3. X Domain: $(-\infty, \infty)$ y Range: $(-\infty, \infty)$

X x – intercept: $(1, 0)$ y y – intercept: $(0, -2)$

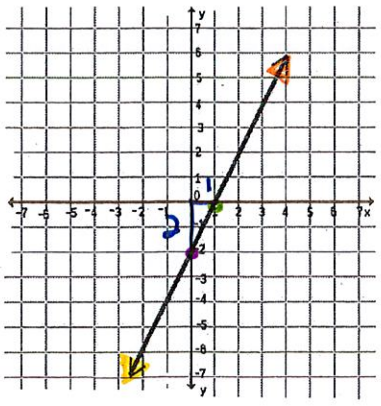
X Increasing: ✓ $(-\infty, \infty)$ Decreasing: X

~~Constant:~~ Slope: 2

End Behavior: As x → + ∞, f(x) → ∞

As x → – ∞, f(x) → $-\infty$

Equation: $y = 2x - 2$



Functions and Rate of change

Write and equation for the function in the table.

$y = mx + b$

hint Determine the slope using the slope formula. Find the y intercept from the table.

x	0	1	2	3	4	5
y	4	6	8	10	12	14
yint		+2	+2	+2		

$y = mx + b$

$y = 2x + 4$

Use the following functions to find the given value or expression:

$f(x) = x + 2$ $\quad g(x) = \frac{1}{2}x + 1$ $\quad h(x) = 2x^2 - 3$ $\quad m(x) = 3 - x$

1) **f(0) =** 2

$f(0) = 0 + 2$

2) **g(8) =** 5

$g(8) = \frac{1}{2}(8) + 1$

$= 4 + 1$

3) **h(2) =** 5

$h(2) = 2(2)^2 - 3$

$= 2(4) - 3$

4) **g(2) + h(2) =** _____

5) **2g(x) + 3f(x) =** _____

6) **(f + g)(x) =** $1.5x + 3$

$f(x) + g(x)$

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

7) **(f-m)(x) =** _____

More on Functions

Find the following values:

Replaces x, so when x = ___ y: ?

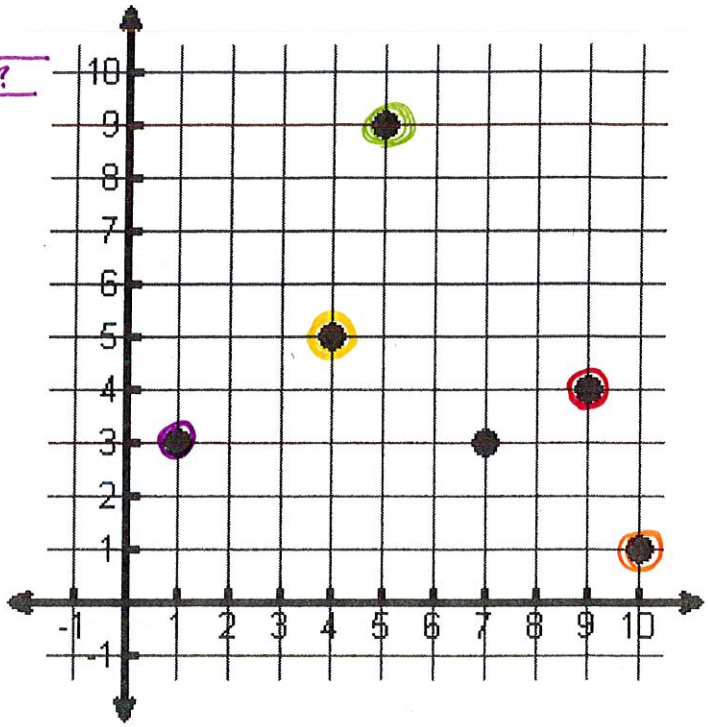
g(1) = 3

g (5) = 9

g(10) = 1

g (4) = 5

g(9) = 4



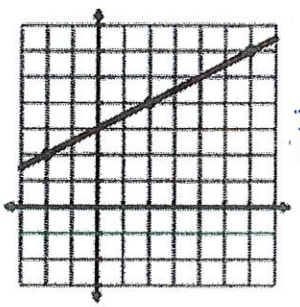
State if the following is a relation or a function, then state why.

1) { (5,2) (6,3) (7,4) (8,3) } F

2) NF → Relation

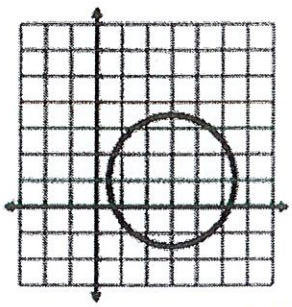
input	3	2	0	3
output	4	-1	2	-3

3)



F

4)



NF → Relation

Arithmetic Sequences

Representation	Common Difference	Explicit Formula	Recursive Formula	Given Term
20. -10, -3, 4, …	7	$a_n = -10 + 7(n-1)$ $= -10 + 7n - 7$ $a_n = 7n - 17$ $a_{17} = 7(17) - 17$	$a_1 = -10$ $a_n = a_{n-1} + 7$	a_{17} 102
21. Camden is collecting bugs for science class. The first day his sister helps him, and he finds 35 bugs. After day 2, he has 51 bugs. On day 3, he has 67 bugs. 35, 51, 67	16	$a_n = 35 + 16(n-1)$ $= 35 + 16n - 16$ $a_n = 16n + 19$ $a_{(5)} = 16(5) + 19$	$a_1 = 35$ $a_n = a_{n-1} + 16$	a_5 99
22. *A museum usually has 4,000,000 visitors. They made some changes to increase visitors. The table shows the projected annual visitors to museum (in millions) after the changes. What is the projected number of visitors in 8 years?*	$d = 2^{nd} - 1^{st}$ $= 7 - 5.5$ $= 1.5$	$a_n = 5.5 + 1.5(n-1)$ $= 5.5 + 1.5n - 1.5$ $a_n = 1.5n + 4$ $a_8 = 1.5(8) + 4$	$a_1 = 5.5$ $a_n = a_{n-1} + 1.5$	a_8 16

Year	Visitors (millions)
0	4
1	5.5
2	7
3	8.5
4	10
n	