Linear Unit Part 1:

Solving Equations

Solving 1 step equations with addition and subtraction	A) $x + 9 = 12$ B) $x - 3 = 11$ C) $-12 = 12 + x$ D) $-15 = -13 + x$ E) $14 + x = -7$ F) $7 = x + 10$

Solving 1 step equations with multiplication and division.	A) $4x = 16$ B) $30 = -5x$ C) $-3x = -60$ D) $\frac{x}{5} = 3$ E) $\frac{x}{-4} = 5$ D) $\frac{3}{4}x = 5$ E) $\frac{-5}{3}x = -2$

Solving 2 step equations Getting rid of fractions first	1. $4x+6=14$ 2. $-p+7=-13$ 3. $9=\frac{r}{-3}+4$ 4. $\frac{x}{4}-5=10$ 5. $5=-6+\frac{x}{2}$ 6. $3x+5=32$

Solving 2 step equations Adding or Subtracting First	1. $9=\frac{x}{2}+4$ 2. $9=\frac{x}{2}+4$ 3. $\frac{x}{-3}-2=5$ 4. $\frac{x}{-3}-2=5$ 5. $2x+6=9$ 6. $4x-2=14$

Rewrite the equation so that y is a function of x Then give the slope and y-intercept	1. $y - 4x = 9$	2. $6y - 6x = 15$
	3. $4 - y = 7x$	4. $\frac{1}{3}y - 5 = 6x$

Rewrite the equation so that y is a function of x Then use the result to find y when x = 0, 5, 7, 10	1. $2x + y = 4$ 2. $5x - 5y = 15$

Multi-Step Equations with like terms on the same side(no negative coefficients)	1. $-12 + 3x + 2x = 3$	2. $x - 6 + 2x = 3$
	3. $3x - 2 - x = 4$	4. $x + 3x - 16 = 4$
Multi-Step Equations with like terms on the same side(negative coefficients)	1. $-1 + x - 3x = 5$	2. $-x - 9 + 3x = 3$
	3. $-3x - 23 + 2x = 7$	4. $-x - 3x + 16 = 4$

Multi-Step Equations with distributive property and like terms on the same side(no negative coefficients)	1. $4x + 7(x - 3) = 34$	2. $2x + 3(2x - 4) = 44$
	3. $3x + 2(x + 2) = 49$	4. $2x + 7(x - 2) = 31$

Multi-Step Equations with distributive property and like terms on the same side(negative coefficients)	1. $-4x + 5(-x + 4) = 34$	2. $-2x + 4(-2x - 2) = 44$
	3. $-3x - 2(2x + 3) = 48$	4. $4x - 7(x - 2) = 31$

	Solving equations with the distributive property and fractions 1. $\frac{2}{3}(x-5)=6$ 2. $\frac{5}{4}(x-1)=10$
	1. $\frac{2}{3}(x-5)=6$ 2. $\frac{5}{4}(x-1)=10$

Multi-Step Equations with like terms on both sides without distributive property	1. 5x = 3x - 8	2. 6x = 4x - 12
	3) $7x-2=5x+10$	4) $-7x+15=-3+2x$
	5) 3x - 21 = - 2x + 9	6) 2x – 9 = -3x + 6
	7) -23 + 2x = - 3x + 7	8) - 6 + 2x = 3 - x

Multi-Step Equations with like terms on both sides with distributive property	1. $2(x - 5) = 3x + 1$ 2. $5(x + 3) = 2x - 9$ 1. $4(x+3)=2(x-6)$ 2. $3(x+2)=4(x-10)$ 3. $-9(x-4)=-(x+20)$

Multi-Step Equations anything goes	1. $4x-3+2x=8x-3-x$ 2. $8y+6-12y=2y+9-3y$

Multi-Step Equations anything goes	3. $9(w-4)-7w=5(3w-2)$ 4) $5-3(x-7)=2(2-x)-8$

Solve the Two-Step Equations – Integers

$3x + 7 = -11 + 2x$	$\frac{2m + 3}{m} = 1$
$-5(2 - w) = 10$	$a - 2 = \frac{a}{3}$
$\frac{b - 1}{2} = b$	$10 - 3k = -5k$

Solve $C = 2\pi r$ for r 1. If a circular pool is 100 ft around, what is the pools radius. Solve $A = lw$ for l 1. If the width of a rectangular sandbox is 20 feet, what length is required to obtain an area of 300 square feet. 2. If the width of the sandbox was to decrease and the area was to remain 200 square feet, how would the length change?	For each of the following geometric formulas, Solve for the stated variable and answer the questions.

Solve P = 2l + 2w for l 1. If you have 100 feet of lumber to construct the sides of a sandbox, and the width is set at 25 feet, how long can the sandbox be? 2. If the width of the sandbox was to increase, but the perimeter was to remain at 100 feet, how would the length have to change? Solve V=lwh for w 1. In designing a box to have a volume of 500 cm3, length 10, and height 15, what is the width? 2. If the volume of the box was to increase, but the length and height were to remain unchanged, how would the width have to change?	

Solve $A=\frac{1}{2}bh$ for h

a. If a triangle has an Area of 100 cm and a base of 20 cm what will the height of the be.

Solve $A=\frac{1}{2}h(b_1+b_2)$ for b_2

a. If a trapezoid has an area of 200 cm, a height of 10 cm, and a base of 5 cm, how big must the other base be.

Rewrite y as a function of x	A) $-4x + y = 9$	B) $-19x + 9y = 8x - 9$
	C) $-3x + 7y - 7 = -1 - 8y$	D) $8x + 2(y + 13) = 10$

Linear Unit Part 5:

Solving Inequalities

Solving Inequalities

Vocabulary:

Inequality is a mathematical sentence that compares two unequal expressions.

Here is a chart of words or phrases associated with the inequality symbols:

$<$	$\leq$	$\geq$	$>$

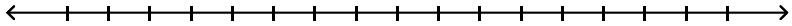
Open dot means the number is _____ of the solution set, thus it is not shaded.

Closed dot means the number _____ of the solution set, thus it is shaded.

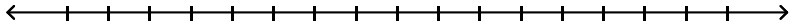
Solving Inequalities

Solve and graph the solution set for the following problems.

A. $-2x > 6$

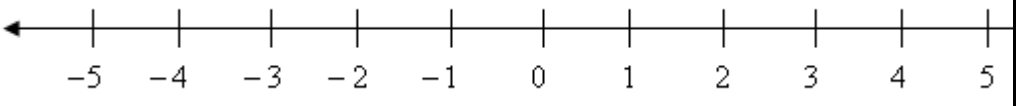


B. $-\frac{1}{2}n \leq 5$



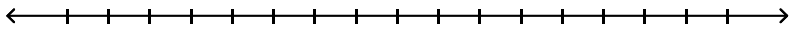
Try-It! Solve and graph the solution set.

$3 \geq 4d + 7$

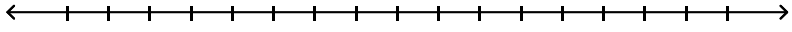


Try-It! Solve and graph the solution set.

A. $-4p+28\geq 8$



B. $2h-13<-23$



Practice: Solve and graph the following inequalities, make your own number line.

1. $-5m < 20$

2. $\frac{j}{6} \leq 0$

3. $5a > -10$

4. $\frac{c}{-3} \geq 6$

5. $m + 6 > 2$

6. $y - 3 < -4$

7. $4x + 11 \geq 19$

8. $6 < \frac{x}{-2}$

9. $27 \geq -0.9r$

10. $5m - 3 > -18$

Multi-Step Inequalities

Solve and graph the solution set for the following problems.

Example 1: $9x + 4 \leq 3x - 14$

Example 2: $-2(x - 4) - 3x < 23$

Practice: Solve and graph the solution set for the following problems

1. $5x+3<2x+15$

2. $2(3+3g)>2g+14$

3. $2(3b-2)<4b+8$

4. $11y-2\leq 3y+14$

5. $3q+6\leq -5(q+2)$

6. $1<8+b$

7. $-4x-4<8$

8. $5-9c>-13$

9. A high school class is planning its annual hayride. There is a flat fee of $50 plus $30 per hour to hire the hay wagon. The class has a budget of $280 for the hayride.

Part A: Write an inequality to find *h*, the number of hours they can hire the hay wagon and stay within budget.

Part B: Solve the inequality.

Unit 3: Lesson 2: Linear Equations and Inequalities

Investigation 1: Who will be the doctor? (p. 188)

How can you use tables and graphs to estimate solutions of equations and inequalities?

The trends in percent of male and female medical doctors can be modeled by these linear functions

Percentage of Male Doctors: $y_1 = 98 - 0.54t$
Percentage of Female Doctors: $y_2 = 2 + 0.54t$

Here y_1 and y_2 represent the percentage of male and female U.S. medical doctors at a time t years **after 1960**

Write equations or inequalities that can be used to estimate answers for each of these questions about the percentage of male and female medical doctors in the United States.

a. In 1985, what percent of U.S. medical doctors were male?

b. When will the percent of male doctors fall to 40%?

c. How long will the percent of female doctors remain below 60%?

d. When will the percent of male doctors decline to only double the percent of female doctors?

Percentage of Male Doctors: $y_1 = 98 - 0.54t$, *where t is the number of years since 1960*

Percentage of Female Doctors: $y_2 = 2 + 0.54t$, *where t is the number of years since 1960*

2. Write questions about trends in percent of male and female medical doctors that can be answered by solving these equations and inequalities.

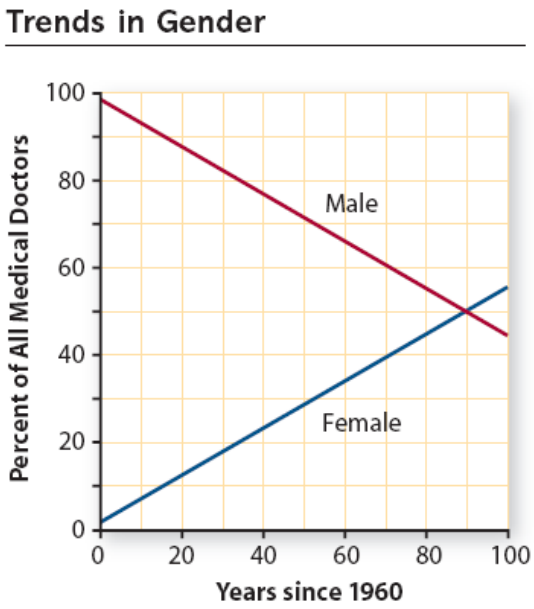
   a. $98 - 0.54t = 65$

   b. $y_2 = 2 + 0.54(50)$

   c. $2 + 0.54t < 30$

   d. $98 - 0.54t < 2 + 0.54t$

   e. $98 - 0.54t = 4(2 + 0.54t)$



t, years after 1960	$y_1 = 98 - 0.54t$	$y_2 = 2 + 0.54t$
0	98	2
10	92.6	7.4
20	87.2	12.8
30	81.8	18.2
40	76.4	23.6
50	71	29
60	65.6	34.4
70	60.2	39.8
80	54.8	45.2
90	49.4	50.6

3. Solve the inequalities below by using the graph or the tables

a. $y_2 = 2 + 0.54(40)$

b. $98 - 0.54t = 90$

b. $98 - 0.54t = 2 + 0.54t$

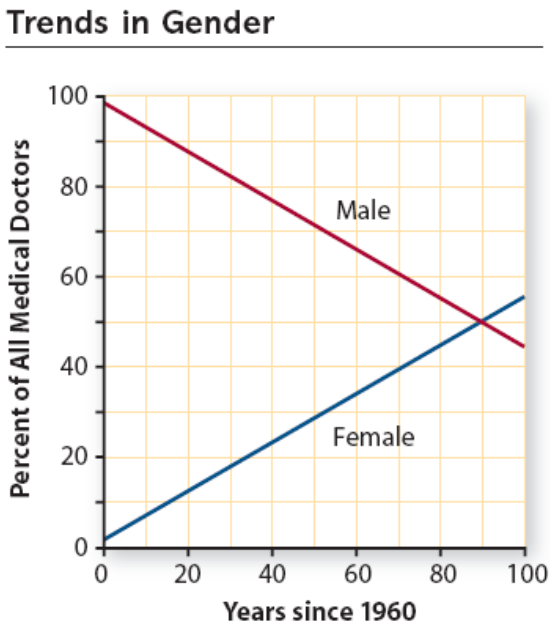
d. $98 - 0.54t > 80$

e. $y_1 = 98 - 0.54(65)$

f. $2 + 0.54t < 29$

g. $98 - 0.54t = 4(2 + 0.54t)$

h. $70 = 2 + 0.54t$



t, years after 1960	$y_1 = 98 - 0.54t$	$y_2 = 2 + 0.54t$
0	98	2
10	92.6	7.4
20	87.2	12.8
30	81.8	18.2
40	76.4	23.6
50	71	29
60	65.6	34.4
70	60.2	39.8
80	54.8	45.2
90	49.4	50.6

4. Write equations and inequalities to represent the following questions. Then use tables or graphs to estimate the solutions for the equations

a. When will the percent of male doctors decline to 55%?

b. When will the percent of female doctors reach 35%?

c. How long will the percent of male doctors be above 40%?

d. What percent of U.S. medical doctors will be male when you are 20 years old?

e. Assuming the trends shown in the graph on, when will the percent of female doctors be more than the percent of male doctors?