Intermediate Algebra
Chapter 1 Test Review

1. Solve: $5(x-2)+3=-7(5x+3)$

$5(x-2)+3=-7(5x+3)$

$5(x)-5(2)+3=-7(5x)-7(3)$

$5x-10+3=-35x-21$

$5x-7=-35x-21$

$5x+35x=-21+7$

$40x=-14$

$\frac{40x}{40}=\frac{-14}{40}$

$x=\frac{-7}{20}$

---

2. Solve: $\frac{5}{3}x-7=2x-\frac{1}{2}$

$\frac{5}{3}x-7=2x-\frac{1}{2}$

$6\left(\frac{5}{3}x\right)+6(-7)=6(2x)-6\left(\frac{1}{2}\right)$

$2(5x)-42=12x-3(1)$

$10x-42=12x-3$

$10x-12x=-3+42$

$-2x=39$

$\frac{-2x}{-2}=\frac{39}{-2}$

$x=\frac{-39}{2}$

---

3. 100 is 32% of what?

$100=(32\%)(x)$

$100=0.32x$

$\frac{100}{0.32}=\frac{0.32x}{0.32}$

$312.5=x$

---

4. 53 is what percent of 75?

$53 = (x)(75)$

$53 = 75x$

$\frac{53}{75} = \frac{75x}{75}$

$0.707 = x$

$70.1\% = x$

---

5. Solve for y: $\frac{1}{8}x - \frac{2}{5}y = -1$

$\frac{1}{8}x - \frac{2}{5}y = -1$

$40\left(\frac{1}{8}x\right) - 40\left(\frac{2}{5}y\right) = 40(-1)$

$5(x) - 8(2y) = -40$

$5x - 16y = -40$

$5x + 40 = 16y$

$\frac{5}{16}x + \frac{40}{16} = \frac{16y}{16}$

$\frac{5}{16}x + \frac{5}{2} = y$

---

6. Solve the linear inequality: $-5(x-3) < 4(x+2) - 7$

$-5(x-3) < 4(x+2) - 7$

$-5x + 15 < 4x + 8 - 7$

$-5x + 15 < 4x + 1$

$-5x - 4x < 1 - 15$

$-9x < -14$

$\frac{-9x}{-9} > \frac{-14}{-9}$

$x > \frac{14}{9}$

---

7. Solve the linear inequality: $\frac{2}{12}x > \frac{1}{20}x - 1$

$\frac{2}{12}x > \frac{1}{20}x - 1$

$60\left(\frac{2}{12}x\right) > 60\left(\frac{1}{20}x\right) - 60(1)$

$5(2x) > 3(x) - 60$

$10x > 3x - 60$

$10x - 3x > -60$

$7x > -60$

$\frac{7x}{7} > \frac{-60}{7}$

$x > \frac{-60}{7}$

---

8. Graph: $y = 4x - 3$

"y=" button
"clear" button
4
"x-key" button
"minus" button
3
"graph" button

---

9. Graph: $5x - 2y = 4$

first we have to solve for y:

$5x - 2y = 4$

$-2y = -5x + 4$

$\frac{-2y}{-2} = \frac{-5x}{-2} + \frac{4}{-2}$

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

now we plug it into the graphing calculator
"y=" button
5
"divided by" button
2

"x-key" button
"minus" button
2
"graph" button

---

10. Find the intercepts of $\frac{5}{6}x-\frac{2}{9}y=-3$

x-intercept:	y-intercept:
$\frac{5}{6}x-\frac{2}{9}(0)=-3$	$\frac{5}{6}(0)-\frac{2}{9}y=-3$
$\frac{5}{6}x=-3$	$\frac{-2}{9}y=-3$
$6\left(\frac{5}{6}x\right)=6(-3)$	$9\left(\frac{-2}{9}y\right)=9(-3)$
$5x=-18$	$-2y=-27$
$\frac{5x}{5}=\frac{-18}{5}$	$\frac{-2y}{-2}=\frac{-27}{-2}$
$x=\frac{-18}{5}$	$y=\frac{27}{2}$

---

11. Find the intercepts of $5x-3y=2$

x-intercept:	y-intercept:
$5x-3(0)=2$	$5(0)-3y=2$
$5x=2$	$-3y=2$
$\frac{5x}{5}=\frac{2}{5}$	$\frac{-3y}{-3}=\frac{2}{-3}$
$x=\frac{2}{5}$	$y=\frac{-2}{3}$

---

12. Find the slope between (-2, -1) and (-6, 3)

$$m=\frac{y_2-y_1}{x_2-x_1}$$
$$m=\frac{(3)-(-1)}{(-6)-(-2)}$$
$$m=\frac{3+1}{-6+2}$$
$$m=\frac{4}{-4}$$
$$m=-1$$

---

13. Find the equation of the line between the points (-2, 4) and (1, -1)

1st: Find m

$$m=\frac{y_2-y_1}{x_2-x_1}$$
$$m=\frac{(-1)-(4)}{(1)-(-2)}$$
$$m=\frac{-5}{1+2}$$
$$m=\frac{-5}{3}$$

2nd: plug in either point for x, y and m from step 1 and solve for b

$$y=mx+b$$
$$-1=\frac{-5}{3}(1)+b$$
$$-1=\frac{-5}{3}+b$$
$$-1+\frac{5}{3}=b$$
$$\frac{2}{3}=b$$

3rd: plug in m and b into y=mx+b

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

14. Find the equation of the line with the following conditions: Parallel to $7x-2y=3$ and passing through the point (-5, -2)

Step 1: Find m

1st: solve the given line for y (if necessary)

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

2nd: identify the slope of this line

$$slope=\frac{7}{2}$$

3rd: find the slope of the line we are trying to find. since parallel lines have same slope and our slope from the previous part was 7/2 then:

$$m=\frac{7}{2}$$

Step 2: Plug in the slope we found in step 1 and the given point into y=mx+b and solve for b:

$$y=mx+b$$
$$-2=\frac{7}{2}(-5)+b$$
$$-2=\frac{-35}{2}+b$$
$$-2+\frac{35}{2}=b$$
$$\frac{31}{2}=b$$

Step 3: plug in m and b into y=mx+b

$$y=mx+b$$
$$y=\frac{7}{2}x+\frac{31}{2}$$

15. Find the equation of the line with the following conditions: Perpendicular to $3x+2y=8$ and passing through the point (-4, -1)

Step 1: Find m

1st: solve the given line for y (if necessary)

$$3x+2y=8$$

$$2y=-3x+8$$

$$\frac{2y}{2}=\frac{-3}{2}x+\frac{8}{2}$$

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

2nd: identify the slope of this line

$$slope=\frac{-3}{2}$$

3rd: find the slope of the line we are trying to find. since perpendicular lines have slopes that are negative reciprocals then:

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

Step 2: Plug in the slope we found in step 1 and the given point into y=mx+b and solve for b:

$$y=mx+b$$

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

$$-1=\frac{-8}{3}+b$$

$$-1+\frac{8}{3}=b$$

$$\frac{5}{3}=b$$

Step 3: plug in m and b into y=mx+b

$$y=mx+b$$

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

16. Graph: $y < 5x + 1$

"y=" button"
"clear" button
5
"x-key" button
"plus" button
1
then left arrow clear to the far left and press enter until you get the lower left corner triangle:

"graph" button
since the original problem had a less than symbol, it will be a dotted line:

17. Graph: $3x + 2y \geq 4$

first solve for y:

$3x + 2y \geq 4$

$2y \geq -3x + 4$

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

$y \geq \frac{-3}{2}x + 2$

then plug it into the calculator:
"y=" button
"clear" button
"negative" button
3
"divide by" button
2
"x-key" button
"plus" button
2
then left arrow clear to the far left and press enter until you get the upper right corner triangle:

"graph" button
since the original problem had a greater than or equal to symbol, it will be a solid line: