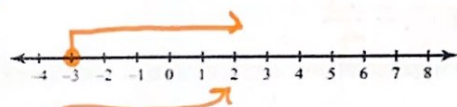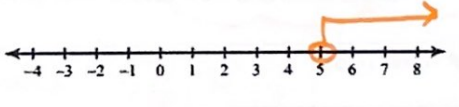# Practice for the Final

Are you ready for our upcoming cumulative final exam? In addition to this review, use the past reviews, past assignments, tests, notes, & proficiency scales as study resources. Your LINEAR INEQUALITY review practice problems (12/7) should be reviewed also. There are no linear inequality questions on this document but linear inequalities are on the final.

Level 2 Approaching the Standards practice problems

Solve the equations. Leave your solutions as SIMPLIFIED FRACTIONS.

1. $2x = 7$ $$\frac{2x}{2} = \frac{7}{2}$$ $x = \frac{7}{2}$	2. $3x - 4 = 5$ $$\frac{+4 \quad +4}{3x = 9}$$ $$\frac{3x}{3} = \frac{9}{3}$$ $x = 3$
3. $\frac{2}{3}x = 8$ $$\frac{3}{2} \cdot \frac{2}{3}x = \overset{4}{\cancel{8}} \cdot \frac{3}{\cancel{2}}$$ $x = 12$	4. $2 - 4x = 10$ $$\frac{-2 \qquad -2}{-4x = 8}$$ $$\frac{-4x}{-4} = \frac{8}{-4}$$ $x = -2$

Solve the inequality and graph the solutions

5. $-3x \le 9$ $$\frac{-3x}{-3} \frac{9}{-3}$$ $x \ge -3$	6. $2x - 4 > 6$ $$\frac{+4 \quad +4}{2x > 10}$$ $$\frac{2x}{2} \frac{10}{2}$$ $x > 5$
Is 2 a solution to the inequality? Explain yes. It makes the inequality true.	Is 5 a solution to the inequality? Explain No. 5 is not greater than 5.

Slope and y-intercept

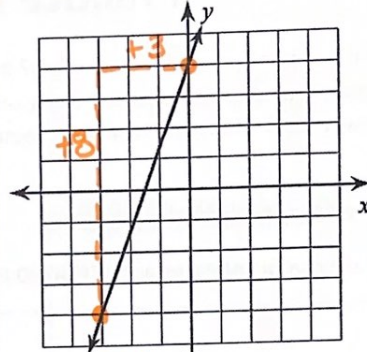| 7. $$y = -\frac{3}{4}x + 4$$ Slope ___-3/4___ B ___4___ y-intercept point ___(0,4)___ | 8. Slope ___3___ B ___7___ y-intercept point ___(0,7)___ | x | y | | --- | --- | | -1 | 4 | | 0 | 7 | | 1 | 10 | $m = \frac{\Delta y}{\Delta x} = \frac{3}{1}$ |

9. Mr. Doolin has a box with 14 cookies in it. He can eat 2 cookies every 3 minutes.

Slope $-\frac{2}{3}$

B 14 starting value

y-intercept point $(0, 14)$

10.

Slope $\frac{8}{3}$

B 4

y-intercept point $(0, 4)$

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11. Determine the slope between the two points. Show you calculation. No graphing.

$(3,4) \text{ and } (1,7)$

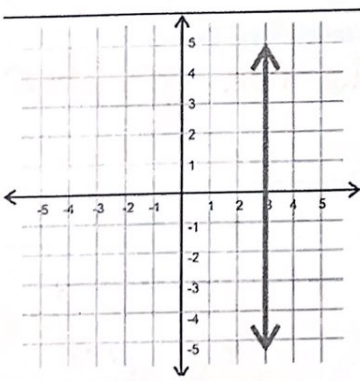$$m = \frac{7-4}{1-3} = \frac{3}{-2}$$

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

12. Determine the slope between the two points. Show you calculation. No graphing.

$(-3,2) \text{ and } (-7,-1)$

$$m = \frac{-1-2}{-7-(-3)}$$
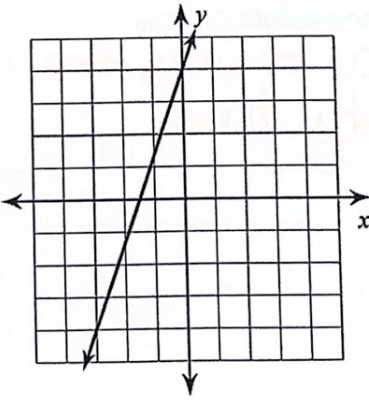
$$= \frac{-3}{-4}$$
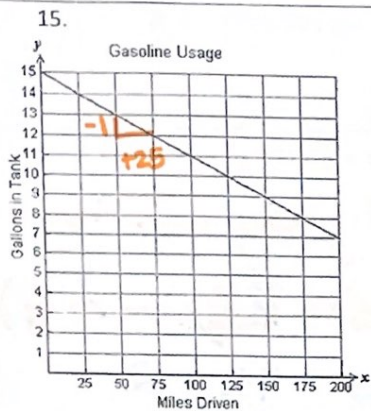
$$m = \frac{3}{4}$$

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13. What is the slope?

$$m = \frac{\Delta y}{\Delta x} = \frac{\Delta y}{0}$$

undefined

14. Is the slope positive, negative, zero or undifined?

positive

15.

Gasoline Usage

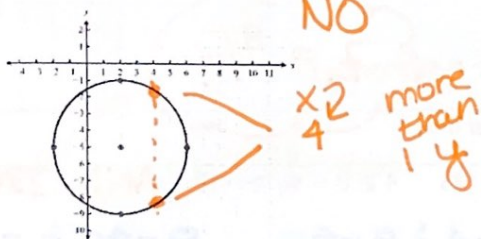What is the slope? $-\frac{1}{25}$

What is the y-intercept? (point)

15

What does the slope represent?

Change in gas in tank over time

What does the y-intercept represent?

Gallons of gas in tank at start

16. For the line $y = \frac{3}{4}x - 2$

What is the slope of the line parallel to this line?

$\frac{3}{4}$ same

What is the slope of this line perpendicular to this line?

$-\frac{4}{3}$

opposite sign reciprocal

17. Is this a function?

NO

$\times 2$ more than 4 $1 y$

Explain For an x value there are more than 1 y values

18. Evaluate the function. $f(x) = -\frac{2}{3}x + 1$

Show your substitution and calculations.

$f(9) = -\frac{2}{3}(\overset{3}{9}) + 1$

$= -6 + 1$

$f(9) = -5$

19. Define a function.

For every input (x) there is only 1 output (y.)

Level 3 Proficient practice problems

Solve the following equations. Leave your solutions as SIMPLIFIED FRACTIONS.

20. $-2(x+3) = 4x-3$

$$-2x - 6 = 4x - 3$$
$$\underline{-4x \qquad\quad -4x}$$
$$-6x - 6 = -3$$
$$\underline{+6 \quad +6}$$
$$-6x = 3$$
$$x = \frac{-3}{6}$$
$$\boxed{x = -\tfrac{1}{2}}$$

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

multiply by LCD: 6

$$6\left(\tfrac{2}{3}x\right) - 6(5) = 6\left(\tfrac{3}{2}x\right) - 6\left(\tfrac{1}{3}\right)$$
$$4x - 30 = 9x - 2$$
$$\underline{-9x \qquad\quad -9x}$$
$$-5x - 30 = -2$$
$$\underline{+30 \quad +30}$$
$$-5x = 28 \qquad \boxed{x = \frac{28}{5}}$$

22. $|w-4| + 2 = 10$

$$\underline{\quad -2 \;-2}$$
$$|w-4| = 8$$

$$w - 4 = 8 \qquad\qquad w - 4 = -8$$
$$\underline{+4 \;+4} \qquad\qquad \underline{+4 \;+4}$$
$$w = 12 \qquad\qquad w = -4$$

$$\boxed{w = -4, 12}$$

23. $4z - 8 = -5z + 2z + 1$

$$4z - 8 = -3z + 1$$
$$\underline{+8 \qquad\quad +8}$$
$$4z = -3z + 9$$
$$\underline{+3z \quad +3z}$$
$$7z = 9$$

$$\boxed{z = \tfrac{9}{7}}$$

Solve the linear inequality AND graph the solution on the number line.

24. $-3x + x + 14 \geq 26$

$$-2x + 14 \geq 26$$
$$\underline{-14 \quad -14}$$
$$-2x \geq 12$$
$$\boxed{x \leq -6}$$

flip sign

Dividing by or multipling by a negative to solve, Flip sign

-8 -6 -4 -2 0

25. $-4 \geq 8 - 4q \geq -12$ AND Intersection

$$-4 \geq 8 - 4q \qquad\qquad 8 - 4q \geq -12$$
$$\underline{-8 \;-8} \qquad\qquad\qquad \underline{-8 \qquad -8}$$
$$-12 \geq -4q \qquad\qquad -4q \geq -20$$
$$\frac{-12}{-4} \quad \frac{-4q}{-4} \qquad\qquad \frac{-4q}{-4} \quad \frac{-20}{-4}$$
$$3 \leq q \qquad\qquad\qquad q \leq 5$$
$$q \geq 3 \quad \text{and} \quad q \leq 5$$

0 1 2 3 4 5

$$\boxed{3 \leq q \leq 5}$$

26. $-11 > m + 4$ or $2m \geq -16$

$-11 > m + 4$
$\underline{-4 \qquad -4}$
$-15 > m$ ⤵

$\dfrac{2m}{2} \geq \dfrac{-16}{2}$
$m \geq \dfrac{-8}{8}$ ⤵

27. Graph the following linear equation. Label the x and y intercept on your graph.

$3x - 4y = 16$

$\underline{-3x \qquad -3x}$

$-4y = -3x + 16$

$y = \dfrac{3}{4}x - 4$

$m = \dfrac{3}{4} \quad b = -4$

$(0, -4)$

x-intercept

y-intercept
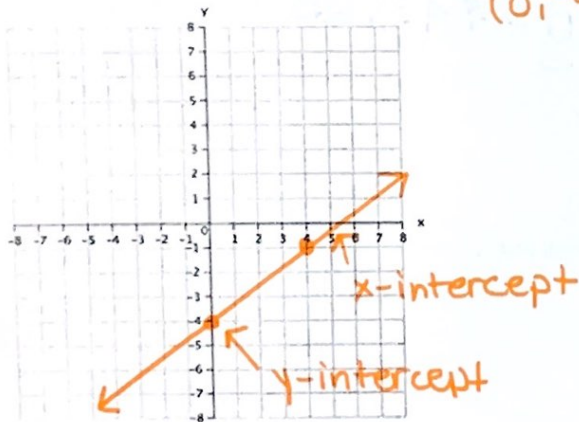
28. Katie has a jar where she keeps her spending money from doing her chores. She spends $3 a week on a coffee each week. In her jar, she has $20. If she does not add to the jar, write an equation for this situation and graph the function. Label your x and y axis with a title and units if needed.

$m = -3$
$b = 20 \quad (0, 20)$

$ in jar (dollars)

Time (weeks)
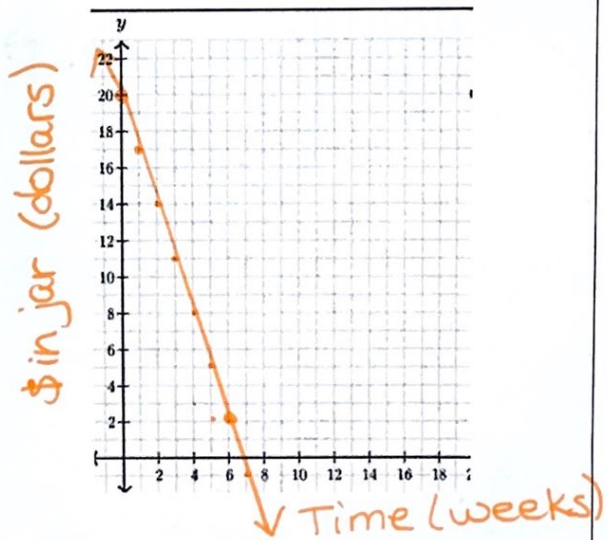
29. Write the equation of the line that passes through the points $(5, -3)$ and $(-2, 6)$. Write your equation is slope-intercept form.

$m = \dfrac{6 - (-3)}{-2 - 5}$

$m = \dfrac{9}{-7}$

$y = mx + b$

$y = \dfrac{-9}{7}x + b$

$6 = \dfrac{-9}{7}\left(\dfrac{-2}{1}\right) + b$

$6 = \dfrac{18}{7} + b$

$\dfrac{42}{7} - \dfrac{18}{7} = b$

$b = \dfrac{24}{7}$

$y = \dfrac{-9}{7}x + \dfrac{24}{7}$

30.

To make your own juice, there is a base cost for materials and a cost per fluid ounce of juice. The table shows the total costs of making different amounts of your own juice.

Amount of juice (fluid ounces)	4	8	12	16
Total cost (dollars)	17	22	27	32

$m = \dfrac{5}{4}$

$b = ?$

a) Write the linear equation of the line for this situation.

$y = \dfrac{5}{4}x + b$

$17 = \dfrac{5}{4}(4) + b$

$17 = 5 + b$

$b = 12$

$y = \dfrac{5}{4}x + 12$

or

$y - 17 = \dfrac{5}{4}(x - 4)$

$y - 17 = \dfrac{5}{4}x - 5$

$\underline{\quad +17 \qquad\qquad +17\quad}$

$y = \dfrac{5}{4}x + 12$

b) What would be the total cost if you made 25 ounces? USE your equation to determine the amount. Show your substitution and calculations of the total.

$y = \dfrac{5}{4}(25) + 12 \quad\rightarrow\quad y = \$43.25$

$= \dfrac{125}{4} + 12$

c) If you have $100 to spend, what is the maximum fluid ounces you can make? Show your work clearly.

$100 = \dfrac{5}{4}x + 12$

$\underline{-12 \qquad\qquad -12\quad}$

$\dfrac{4}{5} \cdot 88 = \dfrac{5x}{4} \cdot \dfrac{4}{5}$

$x = 70.4 \text{ oz}$