

Math 80
Exam 1 Answers

1. (a) Here's one way to solve:

$$\begin{aligned} 1.5t - 19 &= 1 + 6.5t &\Rightarrow & -19 = 1 + 5t && \text{(Subtracting } 1.5t \text{ from both sides.)} \\ & & & -20 = 5t \\ & & & \boxed{-4 = t} \end{aligned}$$

(b) $3(x + 2) - 1 = x + 1 + 2x \Rightarrow 3x + 6 = 3x + 1$
 $6 = 1$ (Subtracting $3x$ from both sides.)

Since we get a completely false result, this equation has no solution.

- (c) Options for solving:

- 1) Dividing both sides by $\frac{3}{4}$, which is the same as multiplying both sides by $\frac{4}{3}$,
- 2) Multiplying both sides by 4 and then dividing both sides by 3.

Here's option 2 in detail: $(4)\frac{3}{4}m = -9(4) \Rightarrow 3m = -36$
 $m = -12$

2. (a) 100 feet

(b) 60 seconds (Time at which the height is 0 feet aside from take-off (time 0).)

- (c) Approximately 2.5 minutes and 50 minutes

(d) Since the balloon goes down 300 feet over 30 minutes, the slope is $\frac{-300}{30} = \text{span style="border: 1px solid black; padding: 2px;">-10 feet/min}$

3. No (When you evaluate at the values $x = -1$ and $y = 2$, the equation is not satisfied, i.e., the left and the right sides of the equation are not equal.)

4. x -Intercept: Evaluate at $y = 0 \Rightarrow \frac{1}{3}x = 0 - 2 \Rightarrow x = -6$ (Mult. both sides by 3)

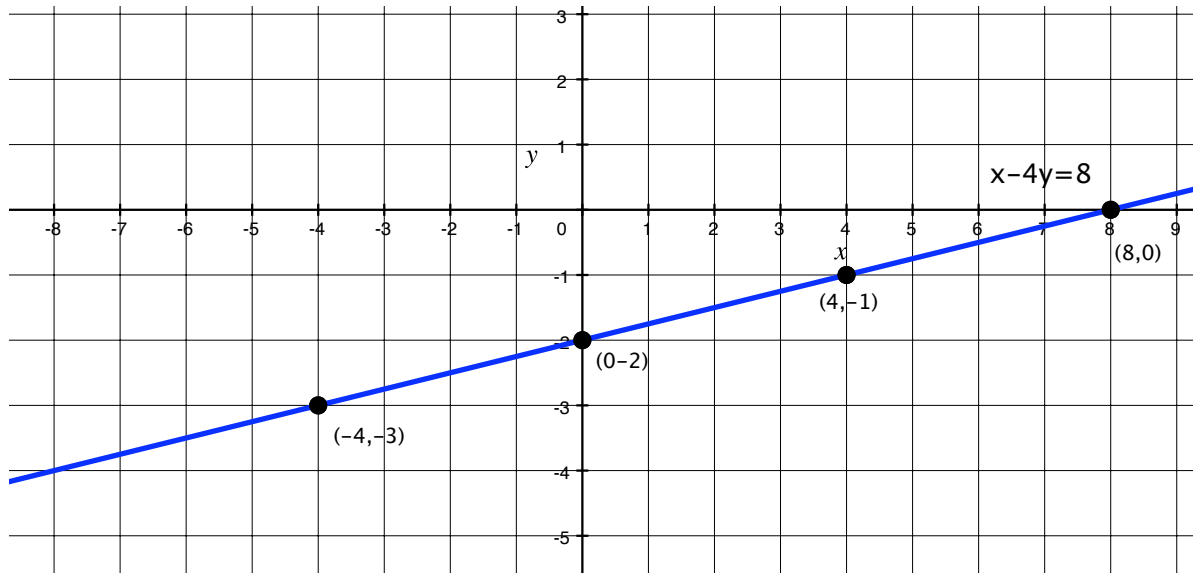
y -Intercept: Evaluate at $x = 0 \Rightarrow 0 = 2y - 2 \Rightarrow 2 = 2y \Rightarrow 1 = y$

So, the intercepts are the points $(-6, 0)$ and $(0, 1)$.

5. $x - 4y = 8$ (You can find points on this line by selecting x or y values and solving for the other variable to complete ordered pairs.)

To make it easier to find “nice” points, solve for y first. $\Rightarrow -4y = 8 - x$
 $\Rightarrow y = -2 + \frac{x}{4}$

Now to find “nice” points, we can use values of x that are multiples of 4. Some points are shown in the graph below.



6. **Unknown:** Time driving until wave = t

Ann drives 35 mph for t hours. \Rightarrow Ann’s distance = $35t$

Carl drives 55 mph for t hours. \Rightarrow Carl’s distance = $55t$

Equation: $35t + 55t = 60$ (Draw a figure to get the equation.)
 $\Rightarrow 90t = 60$
 $\Rightarrow t = \frac{2}{3}$ hours

It takes $\frac{2}{3}$ hours or 40 minutes.

7. **Unknowns:** Betty’s Payment = B , Ann’s Payment = $2B$, Carl’s Payment = $B + 600$

Equation: Sum of all payments = 5000 $\Rightarrow B + 2B + B + 600 = 5000$

$$4B + 600 = 5000$$

$$\Rightarrow B = 1100$$

Betty will pay \$1100, Ann will pay \$2200, and Carl will pay \$1700.

8. The slope of line 1 is $m = \frac{-2-1}{4-(-1)} = -\frac{3}{5}$.

The slope of line 2 is $m = \frac{3}{2}$. (Looking at points on the graph.)

Since the slopes are not equal and they are not negatives reciprocals of each other, the lines are neither parallel nor perpendicular.