

MEMORIAL UNIVERSITY OF NEWFOUNDLAND
DEPARTMENT OF MATHEMATICS AND STATISTICS

SECTION 2.4

Math 1090 Worksheet

FALL 2026

SOLUTIONS

1. (a) Since the line is vertical, all points on the line have the same x -coordinate. Hence an equation of the line is $x = \frac{1}{2}$.
- (b) Since the line is horizontal, all points on the line have the same y -coordinate. Hence an equation of the line is $y = -5$. (This can also be seen from point-slope form with $m = 0$.)
- (c) Using point-slope form, an equation of the line is

$$\begin{aligned}y - (-5) &= -2 \left(x - \frac{1}{2} \right) \\y + 5 &= -2x + 1 \\y &= -2x - 4.\end{aligned}$$

2. The slope of the line is

$$m = \frac{-8 - 4}{2 - (-1)} = \frac{-12}{3} = -4.$$

Using point-slope form with the point $(2, -8)$, then, an equation of the line is

$$\begin{aligned}y - (-8) &= -4(x - 2) \\y + 8 &= -4x + 8 \\y &= -4x.\end{aligned}$$

3. (a) We can write the equation of the line ℓ in slope-intercept form as

$$\begin{aligned}4x + 2y &= -1 \\2y &= -4x - 1 \\y &= -2x - \frac{1}{2}\end{aligned}$$

so the slope of ℓ is -2 . Since the desired line should be parallel to ℓ , it must have the same slope, namely $m = -2$. Then point-slope form gives

$$\begin{aligned}y - 3 &= -2(x - 3) \\&= -2x + 6 \\y &= -2x + 9\end{aligned}$$

as an equation of the desired line.

- (b) Since the desired line should now be perpendicular to ℓ , its slope is $m = -\frac{1}{-2} = \frac{1}{2}$. Again using point-slope form, an equation of this line will be

$$\begin{aligned}y - 3 &= \frac{1}{2}(x - 3) \\&= \frac{1}{2}x - \frac{3}{2} \\y &= \frac{1}{2}x + \frac{3}{2}.\end{aligned}$$

4. (a) Since this is a line, we just need two points to sketch its graph: the x - and y -intercepts. We find the y -intercept by setting $x = 0$. Then $-3y - 12 = 0$ so $y = -4$ and hence the y -intercept is $(0, -4)$. To find the x -intercept, we set $y = 0$ and get $2x - 12 = 0$. Then $x = 6$ and so $(6, 0)$ is the x -intercept. We plot these points and sketch the graph, which is found in Figure 1.

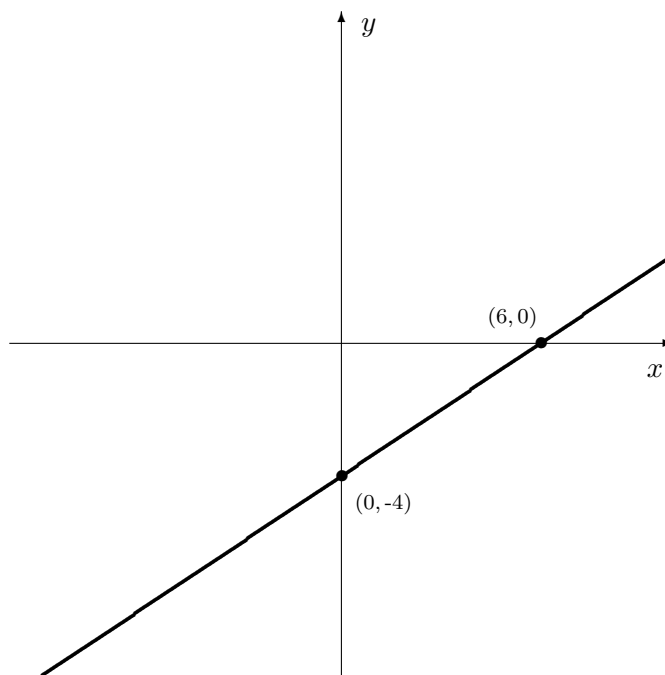


Figure 1: Question 4

- (b) We set $x = 0$ to find the y -intercept, so $3y - 12 = 0$ and $y = 4$. Hence the y -intercept is $(0, 4)$. To find the x -intercept, we set $y = 0$ and get $2x - 12 = 0$. Then $x = 6$ and so $(6, 0)$ is again the x -intercept. We plot these points and sketch the graph, which is found in Figure 2.

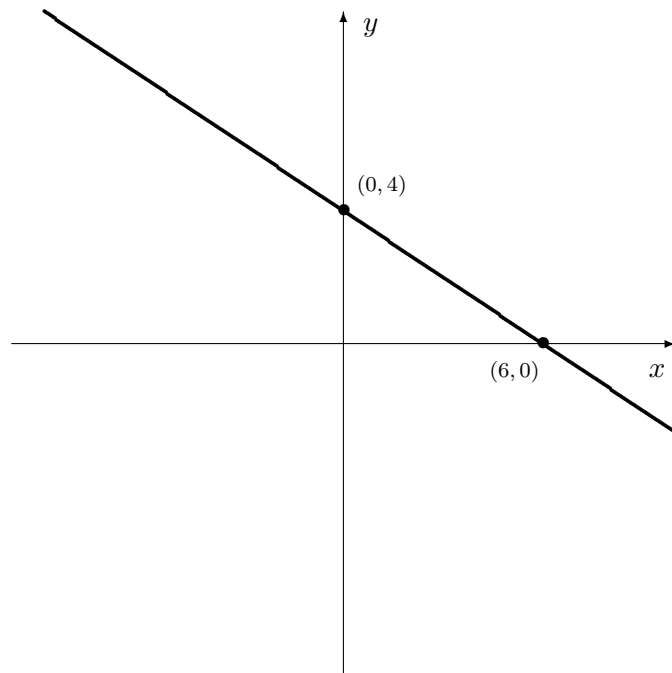


Figure 2: Question 4