

HOMEWORK 1: SOLUTIONS - MATH 111  
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**Problem 1** *Sketch the graph of  $y = x + 1$ .*

**Solution:**

**Problem 2** *Find the  $x$ - and  $y$ -intercepts of the graph in 1.*

**Solution:**

For the  $x$ -intercept, set  $y = 0$ . Then  $x + 1 = 0$ , whence  $x = -1$ .

For the  $y$ -intercept, set  $x = 0$ . Then  $y = 1$ .

**Problem 3** *Sketch the graph of  $y = -2x - 1$ .*

**Solution:**

**Problem 4** *Find the  $x$ - and  $y$ -intercepts of the graph in 3.*

**Solution:**

For the  $x$ -intercept, set  $y = 0$ . Then  $-2x - 1 = 0$ , whence  $x = -\frac{1}{2}$ .

For the  $y$ -intercept, set  $x = 0$ . Then  $y = -1$ .

**Problem 5** The slope of the line passing through the origin and the point  $(3, 1)$  is

- (a)  $-\frac{1}{3}$  (b)  $3$  (c)  $-\frac{1}{2}$  (d)  $\frac{1}{3}$

**Solution:**

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{1 - 0}{3 - 0} = \frac{1}{3}.$$

So (d) is the correct answer. ■

**Problem 6** The equation of the line having slope  $m = 2$  and  $y$ -intercept  $b = 1$  is

- (a)  $y = -2x + 1$  (b)  $y = x + 2$  (c)  $y = 2x + 1$  (d)  $y = \frac{1}{2}x - 1$

**Solution:**

Use the slope intercept form  $y = mx + b$ . Since the slope  $m = 2$  and the  $y$ -intercept is  $b = 1$ , we have  $y = 2x + 1$ . Thus (c) is the correct answer. ■

**Problem 7** The equation of the line that is parallel to  $y = 3x + 2$  and goes through the point  $(2, 7)$  is

- (a)  $y = -\frac{1}{3}x - 1$  (b)  $y = 3x + 1$  (c)  $y = -3x + 1$  (d)  $y = 3x - 1$

**Solution:**

The slopes of the two lines will have to be the same since they are parallel. Thus the slope of the line we are looking for is  $m = 3$ . Now since we also have the point  $(a, b) = (2, 7)$  on that line we may use the point-slope form  $y - b = m(x - a)$ . We get  $y - 7 = 3(x - 2)$  or  $y = 3x + 1$ . Thus (b) is the correct answer. ■

**Problem 8** The equation of the line that has slope  $m = 2$  and goes through the point  $(2, 3)$  is

- (a)  $y = -2x - 1$  (b)  $y = -2x + 1$  (c)  $y = 2x + 1$  (d)  $y = 2x - 1$

**Solution:**

Working in the same way as in 7, with  $m = 2$  and  $(a, b) = (2, 3)$ , we get  $y - 3 = 2(x - 2)$  or  $y = 2x - 1$ . Thus (d) is the right answer. ■