Problem 1. Section 1.2 #62

Find the slope of the line passing through the points $(6, 4)$ *and* $(4, -3)$ *and indicate whether the line is increasing, decreasing, horizontal, or vertical.*

a. $m = \frac{-3-4}{4-6} = \frac{-7}{-2} = \boxed{\frac{7}{2}}$.

b. This line is $\boxed{\text{increasing}}$.

Problem 2. Section 1.2 #66

Find the slope of the line passing through the points $(1, 4)$ *and* $(1, 0)$ *and indicate whether the line is increasing, decreasing, horizontal, or vertical.*

a. $m = \frac{0-4}{1-1} = \frac{-4}{0} = \boxed{\text{undefined}}$.

b. This line is $\boxed{\text{vertical}}$.

Problem 3. Section 1.2 #68

Write the equation of the line with slope 3 passing through $(-3, 2)$ *in slope-intercept form.*

We can use point-slope form to find slope-intercept form:

$$\begin{aligned} y - y_0 &= m(x - x_0) \\ y - 2 &= 3(x - (-3)) \\ y - 2 &= 3x + 9 \\ y &= 3x + 11 \end{aligned}$$

So the answer is $\boxed{\text{y = 3x + 11}}$.

Problem 4. Section 1.2 #72

Write the equation of the line passing through $(-3, 7)$ *and* $(1, 2)$ *in slope-intercept form.*

First, we find the slope of the line:

$$m = \frac{2-7}{1-(-3)} = \frac{-5}{4} = -\frac{5}{4}$$

Then, we use point-slope form:

$$\begin{aligned} y - y_0 &= m(x - x_0) \\ y - 2 &= -\frac{5}{4}(x - 1) \\ y - 2 &= -\frac{5}{4}x + \frac{5}{4} \\ y &= -\frac{5}{4}x + \frac{13}{4} \end{aligned}$$

So the answer is $\boxed{y = -\frac{5}{4}x + \frac{13}{4}}$

Problem 5. Section 1.2 #74

Write the equation of the line with x-intercept -6 and y-intercept 9 in slope-intercept form.

First, we find the slope of the line using the two given points $(-6, 0)$ and $(0, 9)$:

$$m = \frac{9-0}{0-(-6)} = \frac{9}{6} = \frac{3}{2}$$

Then, we use point-slope form:

$$\begin{aligned} y - y_0 &= m(x - x_0) \\ y - 9 &= \frac{3}{2}(x - 0) \\ y - 9 &= \frac{3}{2}x \\ y &= \frac{3}{2}x + 9 \end{aligned}$$

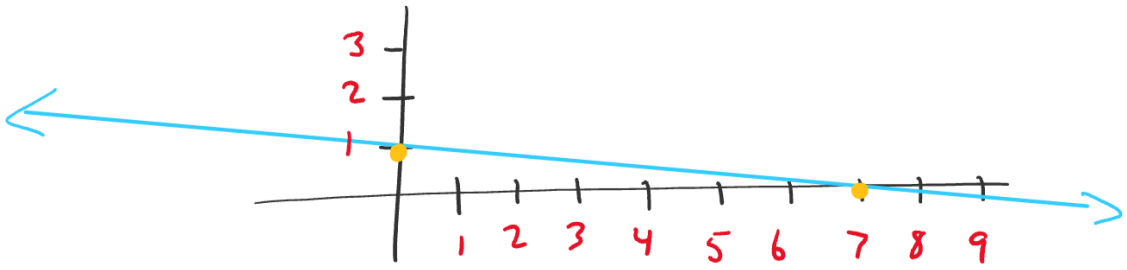
So the answer is $\boxed{y = \frac{3}{2}x + 9}$

Problem 6. Section 1.2 #76

For $y = -\frac{1}{7}x + 1$, give the slope m and y-intercept b, if any, and graph the line.

a. Since the equation is already in slope-intercept form, we can read off the answers $\boxed{m = -\frac{1}{7}}$, $\boxed{b = 1}$

b.



Problem 7. Section 1.2 #82

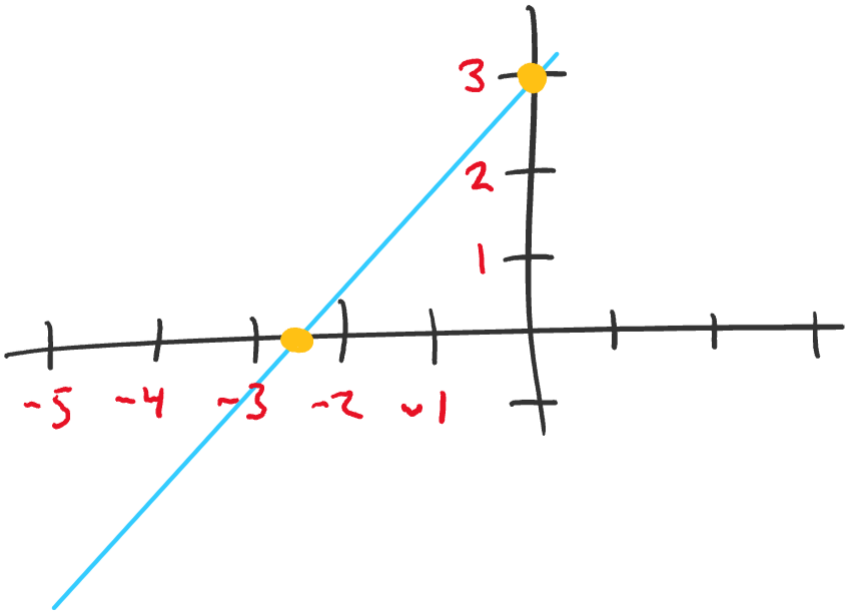
For $6x - 5y + 15 = 0$, give the slope m and y-intercept b, if any, and graph the line.

a. Rearranging the equation into slope-intercept form gives us

$$\begin{aligned} 6x - 5y + 15 &= 0 \\ -5y &= -6x - 15 \\ y &= \frac{6}{5}x + 3 \end{aligned}$$

So $\boxed{m = \frac{6}{5}}$ and $\boxed{b = 3}$.

b.



Problem 8. Section 1.2 #84

For $f(x) = -3x^2 + 6x$ find the degree, zeroes, y-intercept(s), use the leading coefficient to determine the graph's end behavior, and determine algebraically whether the polynomial is even, odd, or neither.

a. The degree is $\boxed{2}$.

b. We solve the equation $-3x^2 + 6x = 0$ to find that the zeroes are at $\boxed{x = 0, 2}$.

c. The y-intercept is at $f(0) = \boxed{0}$.

d. Since the leading term has an even power of x, and the leading coefficient is negative, we find that $\boxed{\text{f(x)} \to -\infty \text{ as } x \to \infty}$ and $\boxed{\text{f(x)} \to -\infty \text{ as } x \to -\infty}$.

e. We find that $f(-x) = -3(-x)^2 + 6(-x) = -3x^2 - 6x$ is not equal to $f(x)$ or $-f(x)$, so $\boxed{f \text{ is neither even nor odd}}$.

Problem 9. Section 1.2 #94

Evaluate $f(x)$ at the given values of the independent variable and sketch the graph.

a. $f(-3) = 4(-3) + 3 = -12 + 3 = \boxed{-9}$

$f(0) = 4(0) + 3 = 0 + 3 = \boxed{3}$

$f(2) = -(2) + 1 = -2 + 1 = \boxed{-1}$

b.