For 1 and 2 use this line: $y = 4x + 3$

1. Write the equation of the line that is parallel to this line and passes through the point (-1, 5)

2. Write the equation of the line that is perpendicular to this line and passes through the point (8, -2)

3. Use this line: $4x - 6y = 30$

Write the equation of the line that is perpendicular to this line and passes through the point (7, -11)

4. Use this line: $x = 9$

Write the equation of the line that is perpendicular to this line and passes through the point (-3, 13)

5. A plumber comes to your house to do a repair and charges you $155 for 3 hours of work. The same plumber comes the next week and charges you $295 for 7 hours of work.

a. Write a linear equation to model the amount of money the plumber charges as a function of the number of hours he spends making a repair.

b. Predict the cost for an 11 hour repair.

c. How much time did the plumber work if the bill was $242.50?

For 1 and 2 use this line: $y = 4x + 3$

1. Write the equation of the line that is parallel to this line and passes through the point (-1, 5)

$$y - 5 = 4(x+1) \quad or \quad y = 4x + 9$$

2. Write the equation of the line that is perpendicular to this line and passes through the point (8, -2)

$$y + 2 = -\tfrac{1}{4}(x-8) \quad or \quad y = -\tfrac{1}{4}x$$

3. Use this line: $4x - 6y = 30$ $\longrightarrow$ $m = \dfrac{-4}{-6} = \dfrac{2}{3}$
Write the equation of the line that is perpendicular to this line and passes through the point (7, -11)

$$y + 11 = -\tfrac{3}{2}(x-7)$$

4. Use this line: $x = 9$ Vertical Line
Write the equation of the line that is perpendicular to this line and passes through the point (-3, 13)

Horizontal Line $\longrightarrow$ $y = 13$

5. A plumber comes to your house to do a repair and charges you $155 for 3 hours of work. The same plumber comes the next week and charges you $295 for 7 hours of work.

$(3, 155)$ $(7, 295)$

a. Write a linear equation to model the amount of money the plumber charges as a function of the number of hours he spends making a repair.

$$\dfrac{295 - 155}{7 - 3} = \dfrac{140}{4} = 35 \quad \$/hr \quad \longleftarrow slope$$

$$y - 155 = 35(x - 3)$$

$$y = 35x + 50 \quad \underset{initial\ charge}{\uparrow}$$

$$y = 35x + 50$$

b. Predict the cost for an 11 hour repair.

$$\underset{x}{\downarrow}\quad y = 35(11) + 50 = \boxed{\$435}$$
$$\underset{y}{\downarrow}$$

c. How much time did the plumber work if the bill was $242.50?

$$242.50 = 35x + 50$$
$$\boxed{x = 5\tfrac{1}{2}\ hrs}$$