

8. Find the unknown number using equations:

a) A number plus 6 is equal to 11. Find x.

$$\begin{array}{r} \downarrow \quad \downarrow \quad \downarrow \quad \downarrow \\ \boxed{x + 6 = 11} \end{array}$$

$$\begin{array}{r} x + 6 = 11 \\ -6 \quad -6 \\ \hline \end{array}$$

$$\boxed{x = 5}$$

b) A number is doubled and the result is -18. Find x.

$$2x = -18$$

$$\boxed{2x = -18}$$

$$\begin{array}{r} 2x = -18 \\ \frac{2}{2} \quad \frac{2}{2} \\ \hline \end{array}$$

$$\boxed{x = -9}$$

9. Solve the following equations (remember solutions can be fractions)

a)  $2a + 3 = 0$

$$\begin{array}{r} -3 \quad -3 \\ \hline \end{array}$$

$$\frac{2a}{2} = \frac{-3}{2}$$

$$\boxed{a = -\frac{3}{2}}$$

$$\boxed{\text{or } a = -1.5}$$

c)  $-5a - 3 = -33$

$$\begin{array}{r} +3 \quad +3 \\ \hline \end{array}$$

$$\frac{-5a}{-5} = \frac{-30}{-5}$$

$$\boxed{a = 6}$$

b)  $7x + 9 = -10$

$$\begin{array}{r} -9 \quad -9 \\ \hline \end{array}$$

$$\frac{7x}{7} = \frac{-19}{7}$$

$$\boxed{x = -\frac{19}{7}}$$

$$\boxed{\text{or } \approx -2.7}$$

d)  $\frac{x}{3} - 9 = 11$

$$\begin{array}{r} +9 \quad +9 \\ \hline \end{array}$$

$$\frac{x}{3} = 20$$

$$\begin{array}{r} \cdot 3 \quad \cdot 3 \\ \hline \end{array}$$

$$\boxed{x = 60}$$

10. I think of a number, triple it and subtract 7. The result is 10. Find the number.

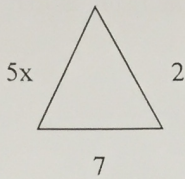
a. Write an equation  $\underline{3x - 7 = 10}$

b. Solve the equation from a. by showing all work.

$$\begin{array}{r} 3x - 7 = 10 \\ +7 \quad +7 \\ \hline 3x = 17 \\ \frac{3x}{3} \quad \frac{17}{3} \\ \hline \end{array}$$

$$\boxed{x = \frac{17}{3}}$$

11.



a. Write an equation for the Perimeter of the above triangle in simplest form.

$$P = 5x + 2 + 7$$

b. If the perimeter is 29 cm., Find the length of the unknown side by solving the equation above. Show your work.

$$\begin{array}{r} 29 = 5x + 9 \\ -9 \quad -9 \\ \hline 20 = 5x \\ \frac{20}{5} = \frac{5x}{5} \end{array}$$

$$x = 4 \text{ cm}$$

$$\text{Side} = 20 \text{ cm}$$

12.

$$3(2x-1) = -21$$

$$\begin{array}{r} 6x - 3 = -21 \\ +3 \quad +3 \\ \hline 6x = 18 \\ \frac{6x}{6} = \frac{18}{6} \end{array}$$

$$x = 3$$

13.

$$14x - 4x = 18$$

$$\frac{10x}{10} = \frac{18}{10}$$

$$x = 1.8$$

~~Tricky~~ 15.

$$2(a+6) = 7 - 2a$$

$$\begin{array}{r} 2a + 12 = 7 - 2a \\ +2a \quad \quad +2a \end{array}$$

$$4a + 12 = 7$$

$$\begin{array}{r} -12 \quad -12 \\ \hline 4a = -5 \end{array}$$

$$\frac{4a}{4} = \frac{-5}{4}$$

$$a = -\frac{5}{4}$$

~~Tricky~~ 14.

$$\begin{array}{r} 3x - 7 = 21 \\ -x \quad -x \end{array}$$

$$2x - 7 = 21$$

$$\begin{array}{r} +7 \quad +7 \\ \hline 2x = 28 \\ \frac{2x}{2} = \frac{28}{2} \end{array}$$

$$x = 14$$

e)

$$2d + 3(d-1) = 7$$

$$2d + 3d - 3 = 7$$

$$5d - 3 = 7$$

$$\begin{array}{r} +3 \quad +3 \\ \hline 5d = 10 \end{array}$$

$$\frac{5d}{5} = \frac{10}{5}$$

$$d = 2$$

2. I am thinking of two numbers. One of them is 11 more than the other, and their sum is 131. What are the numbers?

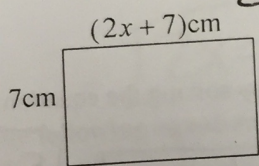
a) Write an equation  $x + (x + 11) = 131$

b) Solve the equation from a). Show all your work.

$$\begin{aligned} x + (x + 11) &= 131 \\ 2x + 11 &= 131 \\ \frac{2x}{2} &= \frac{120}{2} \end{aligned}$$

$$\boxed{x = 60}$$

3.



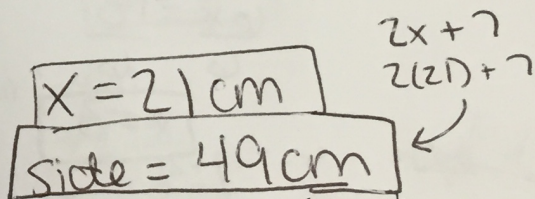
a) Write an equation in simplest form for the perimeter of the rectangle in terms of x.

P = ~~4x + 28~~

$$P = 2(7) + 2(2x + 7) \\ 14 + 4x + 14$$

b) If the perimeter is equal to 112cm. Find the length of the rectangle. Show by solving the equation that you found in a).

$$\begin{aligned} 112 &= 4x + 28 \\ -28 & \quad -28 \\ \hline 84 &= 4x \\ \frac{84}{4} &= \frac{4x}{4} \end{aligned}$$



13. A piece of wood is 16 m long and it is cut into three pieces. Each piece is 1 m longer than each previous piece.

a. Write an equation to assist you

$$\begin{aligned} 16 &= x + (x + 1) + (x + 2) \\ 16 &= 3x + 3 \end{aligned}$$

b. Solve the equation to find the length of the 3 pieces of wood.

$$\begin{aligned} 16 &= 3x + 3 \\ -3 & \quad -3 \\ \hline 13 &= 3x \\ \frac{13}{3} &= \frac{3x}{3} \end{aligned}$$

$$\boxed{x = 4.3 \text{ m}}$$