A car travels at constant speed for 48 kms. The car increases its speed by 1 km/h and covers the same 48 km but 4 hours faster, so what was the original speed of the car??

Solution:

Assume $x\ km/h$ car's the original speed. Then $(x + 1)\ km/h$ car's increased speed.

Write a time equation:

$$time = \frac{distance}{speed}$$

Original speed time = increased speed time + four hours

$$\frac{48}{x} = \frac{48}{x + 1} + 4$$

Multiply both sides by $(x + 1)$ x and cancel the denominators we obtained follows

$$48\ (x + 1) = 48\ x + 4\ (x + 1)\ x$$

Multiply what's in the brackets:

$$48x + 48 = 48x + 4x^2 + 4x$$

Arrange as a quadratic equation:

$$4x^2 + 4x - 48 = 0$$

$$x^2 + x - 12 = 0$$

$$x_1 = -4 \quad x_2 = 3$$

Speed of the car cannot be negative, thus we take only positive solution

Answer: $3\ km/h$