

Activity:

Haulage contracts are often in terms of cubic metres (m^3) of logs. A truck is weighed and weight of the truck loaded minus the weight when empty needs to be converted to m^3 to calculate volume for payment. Weight volume factors vary species and water content of wood eg seasonal variation.

Use the formulas below to answer the questions below following questions:

To convert **tonnes to m^3** , use the following formula.

$$1.0 \text{ tonne} = 0.8700 \text{ m}^3$$

$$\text{So } 30 \text{ tonnes} = 30 \times 0.8700 = 26.1 \text{ m}^3$$

To convert **m^3 to tonnes**, use the following formula.

$$0.8700 \text{ m}^3 = 1.0 \text{ tonne}$$

$$\text{So } 30 \text{ m}^3 = 30 \div 0.8700 \text{ tonnes} = 43.48 \text{ tonnes}$$

Answer the following questions and document how you worked out your response

1. How many m^3 in 4 tonnes?

$$4 \times 0.87 = 3.48 \text{ m}^3$$

2. How many m^3 in 3.2 tonnes?

$$3.2 \times 0.87 = 2.784 \text{ m}^3$$

3. How many tonnes in 43 m^3 ?

$$43 \div 0.87 = 49.4 \text{ tonnes}$$

4. How many tonnes in 52m³?

$$52 \div 0.87 = 59.8 \text{ tonnes}$$

The base haulage rate is \$3.30 per tonne per km (\$/tonne/km) on road Class A.

5. The rate for haulage on road Class B is 123% of haulage on road Class A. What is the rate for haulage Class B?

$$\$3.30 \times 123\% = 3.30 \times \frac{123}{100}$$

$$\text{Class B} = \$4.059 / \text{tonne} / \text{km}$$

6. The rate for haulage on Road Class C is 175% of haulage on road Class A. What is the rate for haulage Class C?

$$\$3.30 \times 175\% = 3.30 \times \frac{175}{100}$$

$$\text{Class C} = \$5.775 / \text{tonne} / \text{km}$$

Use the information provided above to work out the answers to the following questions.

7. What is the rate for hauling 38 tonne of timber along an A Class road for 125km?

$$\text{Class A } \$3.30 / \text{tonne} / \text{km}$$

$$3.30 \times 38 \times 125 = \$15,675$$

8. What is the rate for hauling 37 tonne of timber along a C Class road for 66km?

$$\text{Class C } \$5.775 / \text{tonne} / \text{km}$$

$$37 \times 5.775 \times 66 = \$14,102.55$$

9. What is the payment for hauling 32m^3 of log on a B Class road for 128 km?

$$\text{Class B} = \$4.059/\text{tonne}/\text{km}$$

$$32\text{m}^3 = 32 \div 0.87 = 36.75 \text{ tonner}$$

$$4.059 \times 36.75 \times 128 = \$19,109.12$$

10. What is the rate for hauling 43m^3 of log on a C Class road for 402km?

$$\text{Class C} = \$5.775 \quad 43\text{m}^3 = 43 \div 0.87 = 49.43 \text{ tonnes}$$

$$5.775 \times 49.43 \times 402 = \$114,754.22$$

11. What is the payment for hauling 36m^3 of timber on a B Class road for 378km?

$$\text{Class B} = \$4.059/\text{tonne}/\text{km} \quad 36\text{m}^3 = 36 \div 0.87 = 41.38 \text{ tonnes}$$

$$4.059 \times 41.38 \times 378 = \$63,489.42$$

12. What is the payment for hauling 39m^3 of timber along a C Class road for 58km, followed by 178km along a B Class road?

Class C

Class B

\$5.775

\$4.059

$$39\text{m}^3 = 39 \div 0.87 = 44.83 \text{ tonner}$$

$$(\$5.775 \times 44.83 \times 58) + (\$4.059 \times 44.83 \times 178)$$

$$= 32,389.76 + 15,015.81$$

$$= \$47,405.57$$