**WORD PROBLEMS: LINEAR EQUATIONS.**

1. Kate took 5 hours to travel the 250km from Auckland to Taupo.

 Her average speed for the 1st 3 hours is ***v*** km/h

 Her average speed for the last 2 hours was **10 km/h less** than for the 1st 3

 hours.

 Find her average speed during the 1st 3 hours of the trip.

2. My son is 31 years younger than me.

In 1 year’s time, my son’s age will be one quarter of my current age.

How old am I now?

3. A field is length *x* m and the width is 12m less.

 If I add 30m to the length and the width, the perimeter doubles.

 Find the original dimensions of the field.

4. A chocolate shake costs $2 less than a smoothie.

 If 5 chocolate shakes and 3 fruit smoothies cost $30, find the cost of a

 smoothie.

5. If Jo walks 6km at *x* km/h and 10 km at (*2x*) km/hour her journey takes a total

 of 2 hours.

 Form an equation and solve it to find *x*.

**Applications. Linear equations ANSWERS**

1. Kate took 5 hours to travel the 250km from Auckland to Taupo.

 Her average speed for the 1st 3 hours is v km/h

 Her average speed for the last 2 hours was 10 km/h less than for the 1st 3

 hours.

 Find her average speed during the 1st 3 hours of the trip.

***Let speed for 1st 3 hours be v km/h so distance = speed × time = 3v***

***Distance for 2nd 2 hours = 2(v – 10 )***

***Total dist = 2v – 20 + 3v = 250***

 ***5v = 270***

 ***v = 54 km/h***

2. My son is 31 years younger than me. In 1 year’s time, my son’s age will be one quarter of my current age. How old am I now?

***Let my age = x so son is x – 31***

***When I am x + 1 his age is x – 30 and is ¼ of my current age = x/4***

***x = x – 30***

***4***

***x = 4x – 120***

***120 = 3x***

***x = 40***

3. A field is length *x* m and the width is 12m less. If I add 30m to the length and the width, the perimeter doubles. Find the original dimensions of the field.

***Length = x width = x – 12 so perimeter = 2(2x – 12) = 4x – 24***

***If length = x + 30 and width = x + 18 perimeter = 2(2x + 48) = 4x + 96***

***If this is doubled then***

***4x + 96 = 2(4x – 24)***

***4x + 96 = 8x – 48***

***144 = 4x***

 ***x = 36 m***

***length = 36 m, width = 24 m***

4. A chocolate shake costs $2 less than a smoothie. 5 chocolate shakes and 3 fruit smoothies cost $30. Find the cost of a smoothie.

***Let choc shake costs x, smoothie costs x + 2***

***5x + 3(x + 2) = 30***

***8x + 6 = 30***

 ***8x = 24***

 ***x = 3 choc shake = $3 smoothie = $5***

5. If Jo walks 6km at *x* km/h and 10 km at (*2x*) km/hour her journey takes a total of 2 hours. Form an equation and use it to solve it to find *x*.

***Time = 6 + 10 = 2 so 6 + 5 = 2***

 ***x 2x x x***

 ***so 11 = 2 so x = 11 = 5.5 km/h***

 ***x 2***