ANSWERS TO THE LOCAL MATHS CHALLENGE:

Question 1: Financial Maths – Discounts

Tickets to the carnival are $20 per person, however, Tina is a BTA student, so she gets a 30% discount. How much will Tina pay for entry?

Step 1: Times $20 by 70%

$20 x 70% = $14

Tina will pay $14 for entry to the carnival

Question 2: Ratios

There are approximately 200 axolotls at the carnival. A random sample of 50 axolotls found that 35 of them receive weekly maths tutoring in Mona Vale. Based on this, how many axolotls at the carnival receive weekly maths tutoring in Mona Vale?

Step 1: Write out the ratio

35:50 = *x*:200

Think: what is the relationship between 50 and 200? Then apply that to 35 and *x*.

Step 2: Find the relationship between 50 and 200

50 x 4 = 200

Step 3: Apply this to 35

35 x 4 = 150

X = 150

There are approximately 150 BTA students who receive weekly maths tutoring at the carnival.

Question 3: Area and Circumference of a Circle

a) Calculate the circumference of the Ferris Wheel to the nearest metre.

Formula: Circumference = $2\pi r$

Step 1: Substitute the values into the formula

Circumference = 2 x π x 7 = 43.98229715m

Step 2: Round to the nearest m

43.9822… = 44m

The circumference of the Ferris Wheel is approximately 44m.

b) Calculate the area of the Ferris Wheel to the nearest metre squared.

Formula: Area = πr^2

Step 1: Substitute the values into the formula
Area = π x 7^2 = 153.93804m^2

Step 2: Round to the nearest metre squared
153.93804 = 154m^2
The area of the ferris wheel is approximately 154m^2

Question 4: Ratios
The Ferris Wheel takes one minute and thirty seconds to make a full turn. Find the rate in turns per hour.

Step 1: Convert hours to seconds
1 hour = 60 minutes
1 minute = 60 seconds
60 x 60 = 3600
1 hour = 3600 seconds

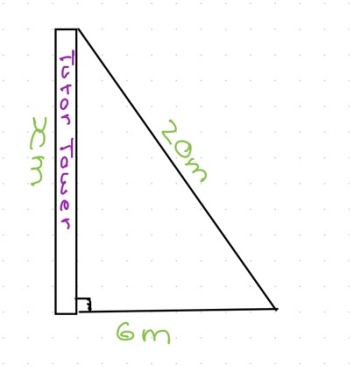
Step 2: Convert 1 minute and 30 seconds to seconds.
1 minute and 30 seconds = 60 + 30 = 90seconds

Step 3: Divide the seconds in an hour by the seconds it takes for the Ferris Wheel to make a full turn.
3600/ 90 = 40
The Ferris Wheel will make 40 full turns in an hour

Question 5: Pythagoras Theorem
Use the diagram to calculate the height of the Tutor Tower to one decimal place.

Formula: $a^2 + b^2 = c^2$
This is where *c* is the hypotenuse.

Step 1: Figure out if you need to calculate the long side or the short side.
Reminder: the long side is called the Hypotenuse and it is opposite the right angle.



The height (*x*m) is not opposite the right angle, therefore it is a short side.

Step 2: Rearrange the formula to calculate the short side.

Formula: $b^2 = c^2 - a^2$

$x^2 = 20^2 - 6^2$

$x^2 = 400 - 36$

$= 364$

$X = \sqrt{364}$

$= 19.07878403$m

Step 3: Round to the nearest m

19.07878403 = 19m

The Tutor Tower is approximately 19m high