

Number Nest Weekly Challenge



Warm up

- a) What is 132 divided by -12? **-11**
- b) Subtract seven squared from twelve squared. **-95**
- c) What is negative six cubed multiplied by negative one? **216**
- d) Round 1.0067 and 2.3015 to 3 significant figures. **1.01, 2.30**

Main challenge

1. A group of six numbers has a mean of -3, what is the new mean when -10 is added to the group of numbers?

$$-3 \times 6 = -18$$

$$-18 - 10 = -28$$

$$-28 \div 7 = -4, \text{ new mean is } -4$$

Remember - The mean is an average. To find the mean, add all the numbers together then divide by the number of numbers.

2. Albert has ridden his bike for 2 hours 40 minutes at 18 miles per hour. How many miles has Albert cycled?

$$2 \text{ hours } 40 \text{ minutes} = 2 \frac{2}{3} \text{ hours}$$

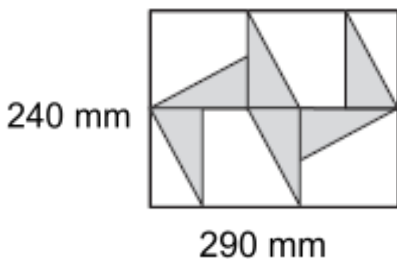
$$\frac{8}{3} \times 18 = 48 \text{ miles}$$

3. Olivia the otter eats 2 clams for every 5 fishes. Olivia ate 91 clams and fishes altogether, how many fishes did she eat?

$$91 \div (2+5) = 13 \text{ groups of clam and fishes}$$

$$13 \times 5 = 65$$

4. Six identical right-angled triangles fit inside a rectangle as shown in the diagram. The rectangle measures 240 mm by 290 mm. What is the total shaded area in cm^2 ?



$$240 \text{ mm} = 24 \text{ cm}, 290 \text{ mm} = 29 \text{ cm}$$

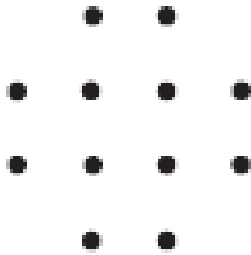
The width of the rectangle is twice the height of the triangle, therefore the height of the triangle is $24 \div 2 = 12$.

The length of the rectangle is made up of twice the height of the triangle and one width of the triangle, therefore the width of the triangle is $29 - 2 \times 12 = 5$.

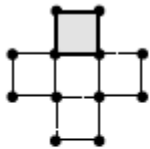
Hence the area of one triangle is $\frac{1}{2} \times 5 \times 12 = 30$, and the total shaded area is $30 \times 6 = 180$.

Bonus

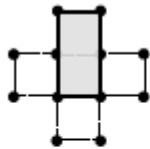
Twelve points are arranged as shown on the right. How many rectangles (including squares) can be made by joining four of these points?



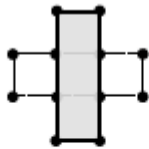
Answer:



5 squares



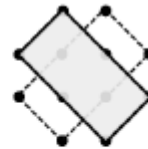
4 rectangles



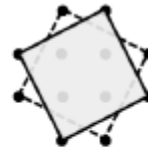
2 rectangles



4 squares



2 rectangles



2 squares

Hence there are 19 rectangles altogether.