

Number Nest Weekly Challenge



Warm up

a) What is the missing number: 80, 40, **20**, 10, 5

b) Which number is bigger: 66% or $\frac{3}{4}$

66% = 0.66, $\frac{3}{4} = 0.75$, so $\frac{3}{4}$ is bigger

c) How many hours are in 5 days? What is 2 hours in seconds?

5 days = 120 hours

2 hours = 7200s

d) Round 386900 to the nearest thousand. **390000**

e) Round 274.38 to the nearest tens. **270**

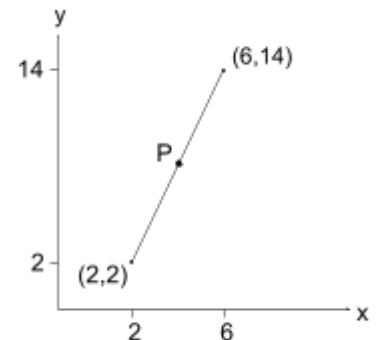
Main challenge

1. Aria draws a straight line from (2,2) to (6, 14) on the graph. Point P is exactly halfway on the line. What are the coordinates of point P?

Find the average between the two x coordinates and the two y coordinates.

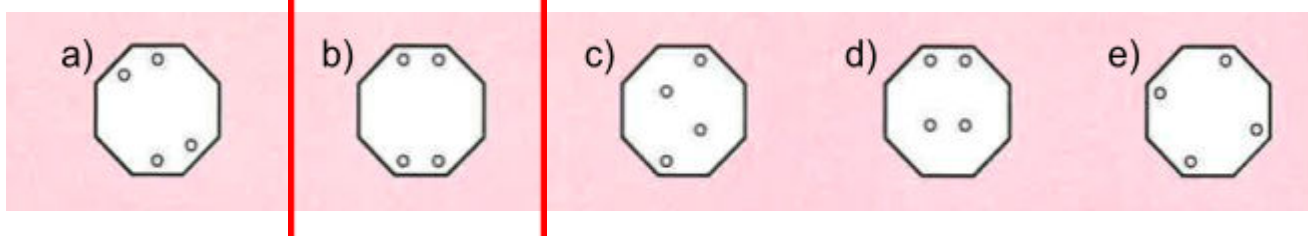
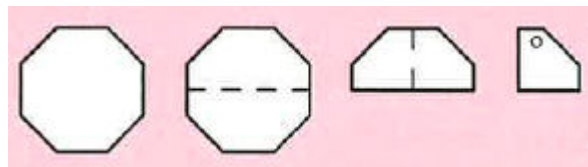
$$\frac{2+6}{2} = 4 \quad \frac{2+14}{2} = 8$$

P must be (4,8)



2. The piece of paper on the right is folded in half twice as shown, and a hole is punched through the resulting folded shape.

What would the paper look like unfolded?



3. The lightest birds in the world are bee hummingbirds, 5000 of which would weigh 8 kilograms. How heavy is an individual hummingbird in grams? How many hummingbirds would weigh 8 tonnes together?

$$8 \text{ kg} = 8000 \text{ g}$$

$$8000 \div 5000 = 1.6 \text{ g is the weight of one bee hummingbird}$$

$$8 \text{ t} = 8000 \text{ kg}$$

$$5000 \text{ birds weigh } 8 \text{ kg, so } 5000 \times 1000 \text{ birds must weigh } 8000 \text{ kg}$$

In other words, 5 million bee hummingbirds would weigh 8 tonnes in total!

4. Which one of these calculations is **incorrect**?

$$\text{a) } 4 \times 5 + 67 = 45 + 6 \times 7 \quad \text{b) } 3 \times 7 + 48 = 37 + 4 \times 8 \quad \text{c) } 6 \times 3 + 85 = 63 + 8 \times 5$$

$$\text{d) } 2 \times 5 + 69 = 25 + 6 \times 9 \quad \text{e) } 9 \times 6 + 73 = 96 + 7 \times 3$$

$$9 \times 6 + 73 = 127$$

$$96 + 7 \times 3 = 117$$

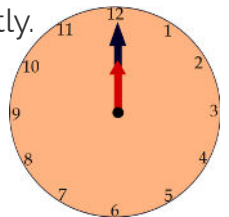
$$\text{So } 9 \times 6 + 73 \neq 96 + 7 \times 3$$

Bonus

At midday the hour and minute hands of a clock sit on top of each other perfectly.

In a little over one hour they will again be on top of each other.

What is the time to the nearest minute that this happens?



**The hour and minute hand will not cross each other in the first hour (given in question).
At precisely one o'clock, the hour and minute hand will be 30° apart.**

The hour hand moves 30° per 60 minutes, so $\frac{1}{2}^\circ$ per minute. The minute hand moves 360° per 60 minutes, so 6° per minute.

Let x be the time take from 13:00 for the hour and minute hands to be on top of each other,

Then:

$$30 + \frac{1}{2}x = 6x$$

$$\frac{11}{2}x = 30$$

$$x = \frac{60}{11} \approx 5.45 = 5 \text{ to the nearest minute}$$

So the hour and minute hand overlap at 13:05 pm.