

1. What is the smallest multiple of 28 that is also a multiple of 42?

Answer: 84

* $28 = 2 \times 2 \times 7, 42 = 2 \times 3 \times 7, \text{ so } 2 \times 2 \times 3 \times 7 = 84.$

2. Usain Bolt’s top speed is 54 km/h. What is this in meters per second?

Answer: 15

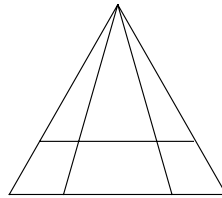
* $54 \text{ km/h} = 54 \times 1000 \text{ m} \div (60 \times 60 \text{ s}) = 15 \text{ m/s}$

3. Calculate $500 - 499 + 498 - 497 + 496 - 495 + 494 - 493 + 492 - 491$.

Answer: 5

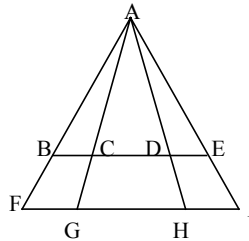
* $(500 - 499) + (498 - 497) + (496 - 495) + (494 - 493) + (492 - 491)$
 $= 1 + 1 + 1 + 1 + 1 = 5$

4. How many triangles are there in the diagram?



Answer: 12

* They are: $\triangle ABC, \triangle ACD, \triangle ADE, \triangle ABD, \triangle ACE, \triangle ABE, \triangle AFG, \triangle AGH, \triangle AHI, \triangle AFH, \triangle AGI, \triangle AFI$. Total 12 Triangles.



5. A die has faces labelled A, B, C, D, E, and F. Two pictures of this die, taken from different angles, are shown below. Which face is on the opposite side of face B?



Answer: D

6. There are 30 people standing in a line. Dan is the 5th from the left while Emily is the 11th from the right. How many people are standing between them?

Answer: 14 people in between

* 4 people before Dan and 10 people after Emily, then take away Dan and Emily $30 - (4 + 10 + 2) = 14$. See also the figure below.



7. When we change a positive 2-digit number by adding an “8” to the front, how much do we add to the number?

Answer: 800

* The 8 is added to the hundreds position.

8. How many 3-digit numbers are there? (3-digit numbers cannot start with 0)

Answer: 900

* On the hundreds digit we have 9 numbers to choose from, since it cannot be 0. On the tens and ones digits, we have 10 choices for each. Thus there are $9 \times 10 \times 10 = 900$ numbers. Another way to do this problem is by observing that the largest 3-digit number is 999, while the smallest one is 100. Thus there are $999 - 100 + 1 = 900$ 3-digit numbers in total.