



Solutions

1 **Method 1 :** Use the least common multiple.

The number is 3 more than a multiple of 7 and also 3 more than a multiple of 8.

Since 7 and 8 have no factors in common, their least common multiple is $7 \times 8 = 56$.

The greatest four-digit multiple of 56 is 9968.

So the greatest such number is $9968 + 3 = 9971$.

Method 2 : Make two lists and look for a common number.

Four-digit multiples of 7: 9996, 9989, 9982, 9975, 9968, ...

Four-digit multiples of 8: 9992, 9984, 9976, 9968, 9960, ...

$$9968 + 3 = 9971$$

The greatest number to leave a remainder of 3 when divided by 7 or by 8 is 9971.



Solutions

2 Method 1 : Find the interval between each knock.

One minute has 60 seconds. Because $60 \div 18 = 3\frac{1}{3}$, one minute interval has $3\frac{1}{3}$ periods of 18 seconds each.

Because the clock knock 9 times in each period, **the clock knocks $9 \times 3\frac{1}{3}$ or 30 times in 1 minute.**

Method 2 : Find the proportion for the number of knocks.
Set up a proportion using knocks per second.

Let N = the number of knocks in 60 seconds.

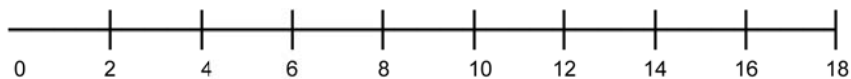
$$\text{Then } \frac{\text{knocks}}{\text{sec.}} = \frac{9}{18} = \frac{N}{60}.$$

Solve to get $N = 30$.

The clock knocks 30 times in 1 minute.

Method 3 : Draw a diagram.

$$18 \div 9 = 2$$



The interval between each knock is 2 seconds.

Number of knocks	Duration
1	$1 \times 2 = 2$ seconds
5	$5 \times 2 = 10$ seconds
10	$10 \times 2 = 20$ seconds
20	$20 \times 2 = 40$ seconds
30	$30 \times 2 = 60$ seconds

The clock knocks 30 times in 60 seconds or 1 minute.



Solutions

3 Method 1: Draw simple diagram.

Think of the number as a straight line with segments:



Add 9 to the one third of the number.



Double the lower line so we can get the original line:



Clearly, one segment of the line equals 18.

The original line will be $3 \times 18 = 54$.

Hence the original number is 54.

Method 2: Algebra.

Let N represent the number.

Then,

$$\frac{N}{2} = \frac{N}{3} + 9$$

$$\frac{N}{2} - \frac{N}{3} = 9$$

$$\frac{3N - 2N}{6} = 9$$

$$\frac{N}{6} = 9$$

$$N = 54$$



Solutions

4 **Method:** *Analyse and draw simple diagram.*

In order to place 3 girls in between 2 boys, first we place 1 boy follow by 3 girls. After that, continue the line with another 1 boy and 3 girls. We can separate the students in groups of 4, with 1 boy and 3 girls in each group. We can have 6 such groups. In the 7th group, there will be 3 boys and 1 girl. The line looks like below:

BGGG BGGG BGGG BGGG BGGG BGGG B**BBG**

Hence, there are 19 girls and 9 boys in 5A class.

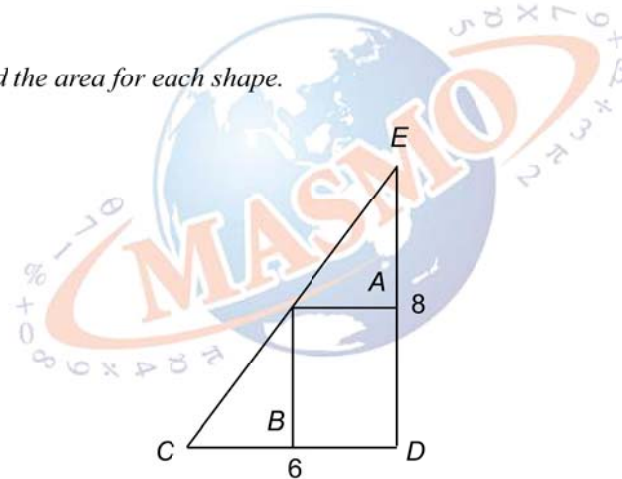
The difference of the number of boys and girls is 10.





Solutions

5 Method: Find the area for each shape.



The area of the rectangle is $3 \times 4 = 12$.

The area of the triangle is $\frac{1}{2} \times 6 \times 8 = 24$.

Hence the fraction is $\frac{\text{area of rectangle}}{\text{area of triangle}} = \frac{12}{24} = \frac{1}{2}$.