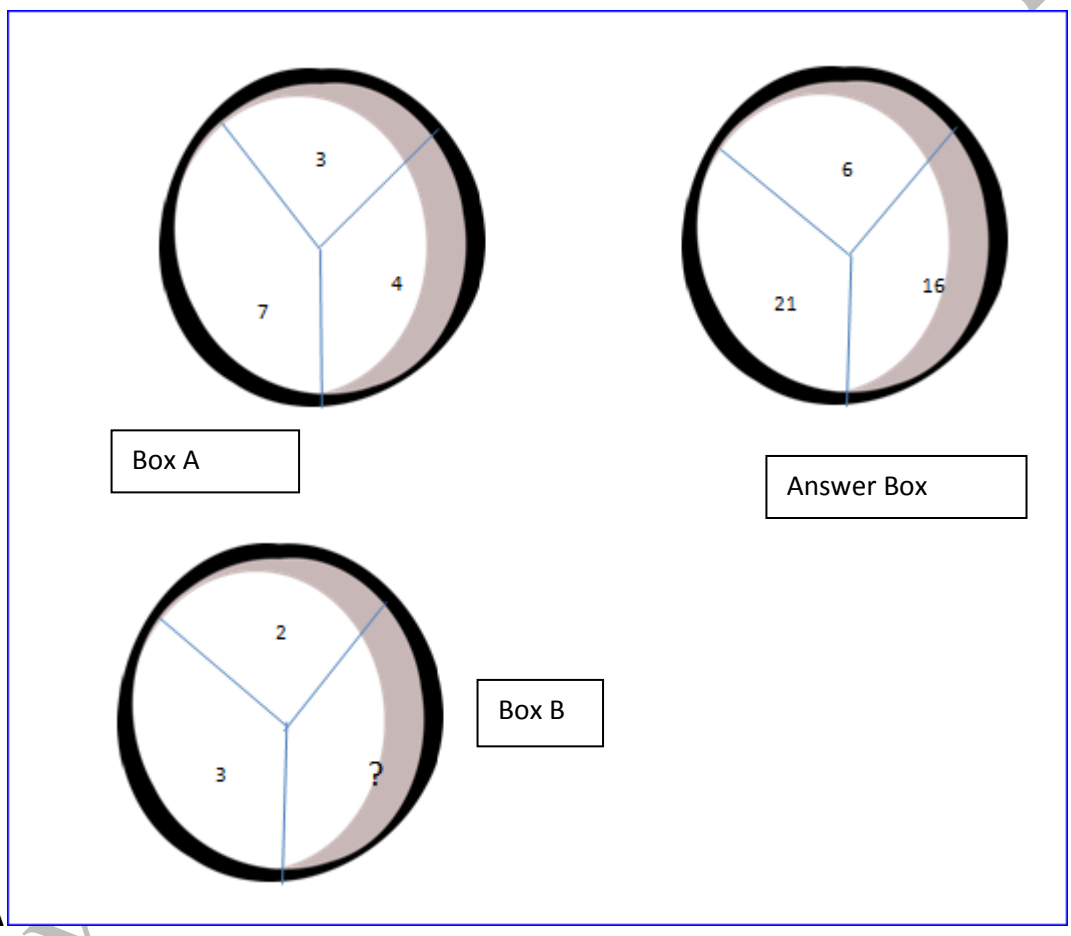
Year 6 (Questions) These selection of questions cover a variety of questions which children are expected to answer correctly after using some analysis and deductive reasoning. They are not difficult, however children must be able to break the question down into parts and work on arriving at the solution.

These are a selection of questions which cover different sorts of areas in Maths, from ratios, to fractions, to graphs, to geometry, to IQ questions to spatial reasoning questions.

Question 1



A

What number will replace the question Mark? Box A and Box B are related to derive the answer in the "Answer Box" (5- minute time limit) (Considered easy to answer in one look)

The Answer: For this question it is important to slowly figure out how Box A and Box B are related, in this question,

It is important to try out the and look at the relationship (e.g. 3 from box A, 2 from Box B with an Answer 6. 7 from Box A, 3 from Box B with an answer of 21. Just looking at this- you can tell that the (Multiplication) sign is the factor. So if in box A has a 4 and the answer box has a 16, it is now similar to 4 x .....= 16, the Answer is 4.

2) Express 12 seconds as a ratio of 1 hour.

a) 1:5 b) 1: 240 c) 1: 300 d) 1: 500

Answer: 12 seconds as a ratio of 1 hour. I hour has 3600 seconds.

12:3600

6:1800

3:900

1:300 (Answer)

Complete the table below, giving your answer in the simplest form where necessary,

Fraction	Decimal	Percentage
A) 2/5	0.6 b)	b) C) 65%

Answer: 0.6 is equal to 6/10 equal to 3/5. Answer A is 3/5, b) is equal to 60%.

2/5 is equal to 4/10 =0.4, percentage is equal to 40%.

4) The membership of a sporting club the Hawks decreased by 20% because the club increased the fees by 30%. There were 200 members this year. How many members were there in the club last year?

Answer: If the membership decreased by 20% that means that 80% represents the number of people in the club this year.

80% represents 200 people

100% represents 200 x 100/80 =250 people, if we do a check,

100% represents 250 people

10 % represents 250/100=25 people, 20% represents 50 people 250 people- 50 people -200 which is the amount of members this year.

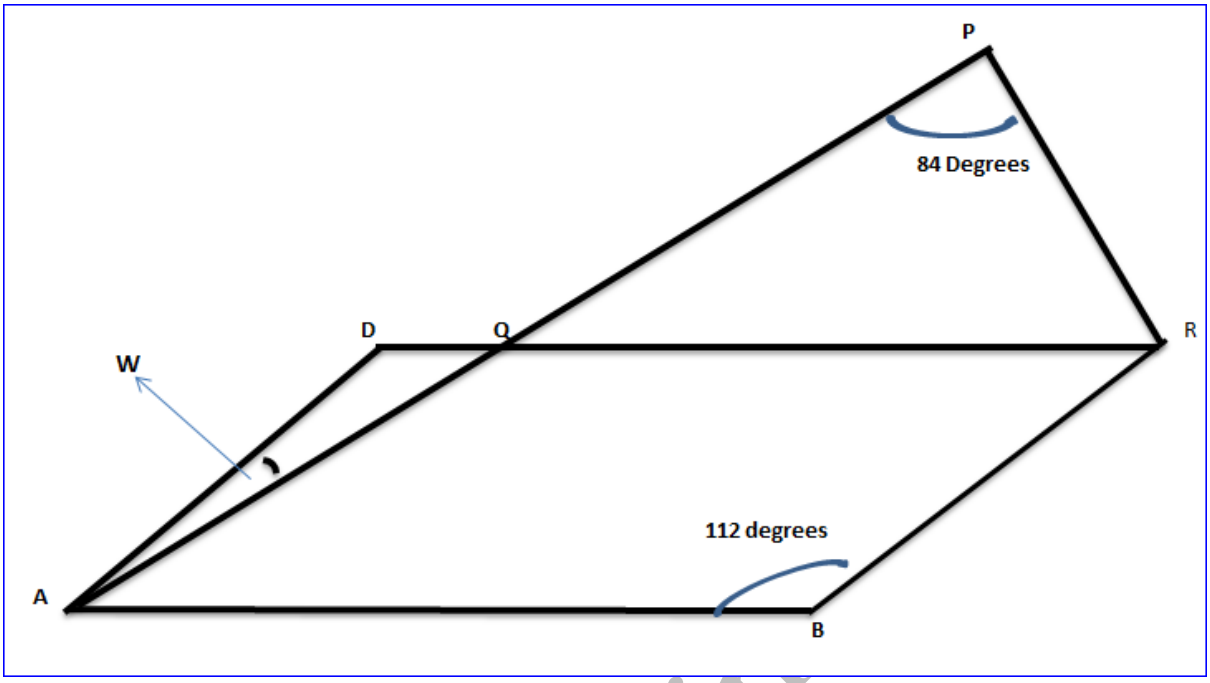
5) Two brothers took a test to get into a Top university in France. George answered 60% of the questions correctly. While his brother answered 25% of the questions incorrectly. How many percent more questions did George answer incorrectly compared to this brother.

This question is an Easy question, but must be approached slowly and carefully taking into consideration the English,

1) **George answered 60% of the questions correctly. Therefore he answered 40% of the question incorrectly.**
2) **His brother answered 25% wrongly-**
   George answered 40%-25%= 15% incorrectly.

6) Look through the figure and take your time to understand how the parallelogram is related to the triangle. There is an isosceles triangle PQR and ABRD is a parallelogram. Angle P is 84 degrees and Angle B is 112 degrees.

Calculate what is the value of angle a.



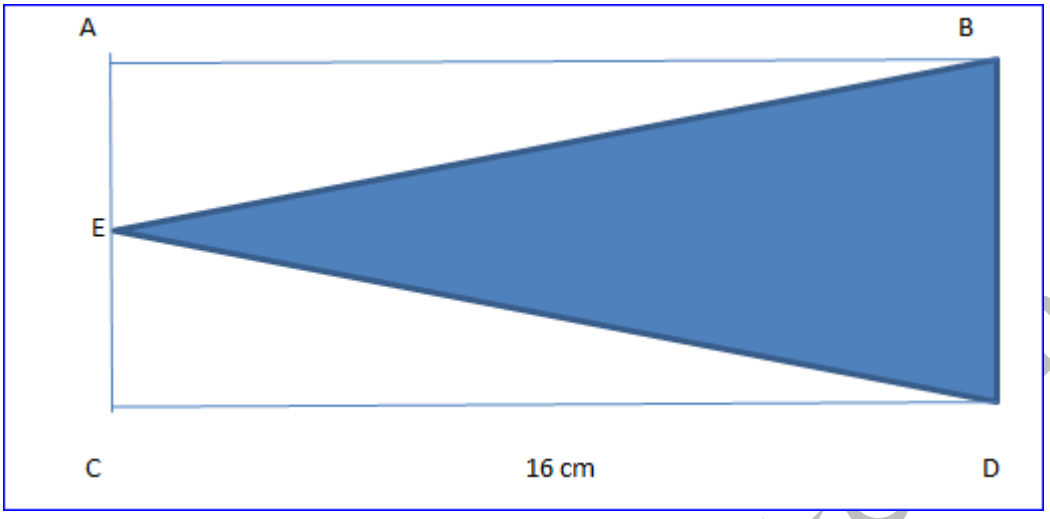
Let's work through this question slowly.

Angle P is 84 degrees. If Triangle PQR is an isosceles triangle, that means the base of the two angles Q and R are equal. Therefore the value of Angles Q and R = (180-84) =96 degrees for both and each angle is equal to 96/2=48 degrees.

Angle DQA= 48 degrees being opposite when two parallel lines run across the line DQ and AB.

If Angle B is 112 degrees, Angle D is 112 degrees as well. Because it's a parallelogram. We now have Angle D equivalent to 112 degrees and angle Q to be 48 degrees. If a triangle has 180 degrees Angle A is (180-48-112=20 degrees).

7. Area and Perimeter.



The figure is a Rectangle where the length is 16 cm and the breadth is 14 cm. If AE is 8 cm. Find the area of the shaded portion.

There are two ways we can answer this question. One way is to eliminate the white the white portion in the Rectangle and the second is to apply the formula for the area of a triangle lets apply the formula for the area of the triangle

½ x h x b=1/2 x 14 x 16=112 sq cm (Note if its area it is measured in sqs)

8) Use the information below to answer question 8 and 9. At the club there were some elderly folks that came to the club to play bridge. This is the statistics that was collected.

Number of games Played	0	1	2	3	4	5
Number of people	3	6	7	8	9	4

a) **How many people played at least 3 games**

b) **If it took about 25 minutes for a person to play a bridge game. What was the longest time that one of these people took playing the game. Give your answer in hours and minutes..... (Hint: you have to look at the grouping of people that played the most games to start your calculation)**

No of people who have played at least 3 games = 8 people +9 people+ 4 people=21 people

In part (b), the number of people that have played the most games is 4 people playing 5 games. If one game is 25 minutes, 5 games is 125 minutes. 125 minutes is equivalent to 2 hours and 5 minutes.

9) The breadth of a rectangular tank was 2/3 its length. The tank was filled with 3000 cubic cm of water to a height of 20 cm. Find the length of the tank.

In Order to answer this question, it is important that we try and line up all the variables that we know first.

The tank is 3000 cubic cm

Height is 20cm.

Breadth is 2/3 its length

So if we apply the formula, of length x breadth x height=3000cm cube

Lxbxh=3000

2/3 of Length (breadth) x length=3000/20

1 +2/3 length=150.....

We know that Breadth: Length

2:3

Length x Breadth =2 x 3= 6 units

6 units= 150

1 unit =150/6=25 cm square.

1 unit is (5x 5) = 25 cm square.

1 unit is equal to 5 cm.

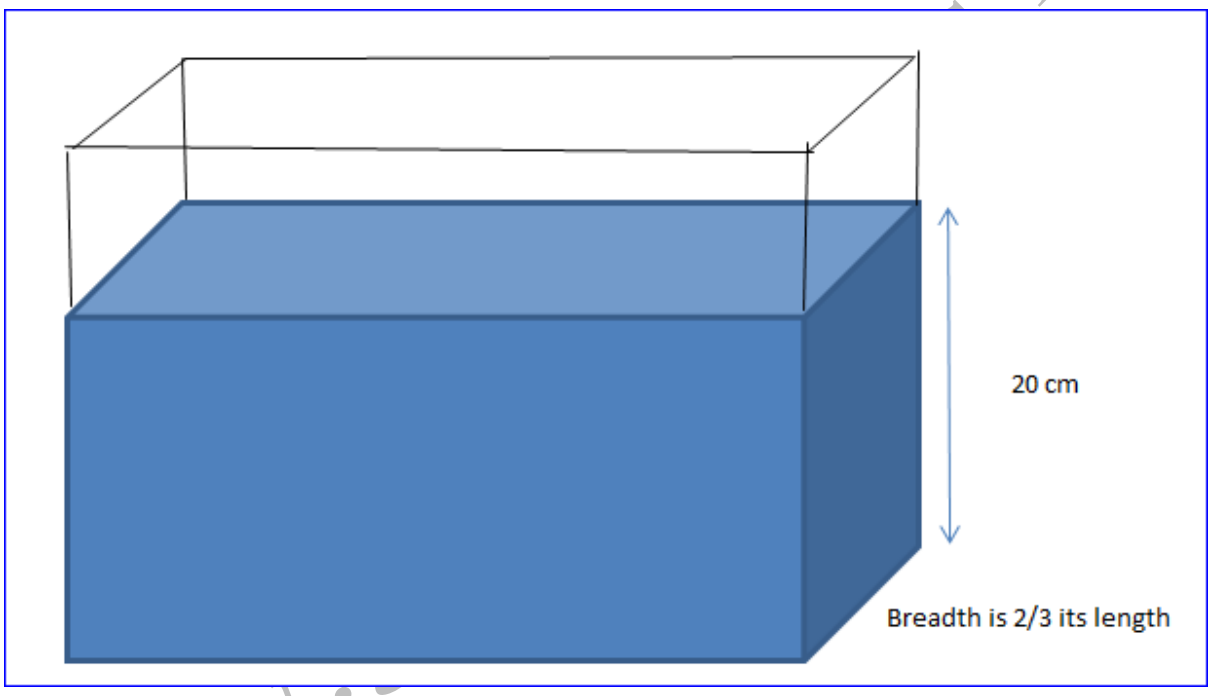
So if we know that length is equivalent to 3 units- 5 x 3= 15 cm

The breadth we are told is 2/3 the length which is 2/3 x 15=10 cm.

So now let's apply the full formula,

Length x Breadth x Height= 3000cm cube

15 x 10 x 20= 3000 cm cube. (It is always important to check back to see that we have got all the parts of the equation to see if we are correct).



10) As Christmas was approaching, a small plantation owner noticed that he did not have much fruit in his orchard. However the little oranges he had he decided that he would pluck it. By the time he reached home he had given 75% to his son, 0.625 of the remainder to his neighbour and ate one of the remainder. When he got home he found out that he had only 2 oranges left. What is the original amount of oranges that he picked up from his orchard?

This mathematics problem can look daunting on reading as it seems there is not many clues, however , what one must do is have the ability to work backwards to get back to the start and then ..... Use the start to check back to see if your working is correct. So let's do that.

He starts off with 2 oranges, he ate one therefore 2+1 = 3, (Part 1), (Note that we are moving in the reverse direction now let's work out part 2,

If he gave 0.625 away that means he had 1-0.625=0.375 for himself, from there. So moving backwards that is (3 divided by 0.375), the answer from part 1 which is equivalent to 8,

So if he gave .75 away that means he had .25 to himself.... so once again moving backwards we take 8 divide by 0.25 we get (8 divide by 0.25= 32)

So now that we have got an answer of 32, it is important to check back to see if the answer is correct.

The farmer starts of with 32 oranges he had given 75% away to his son (32 x .75=24). That leaves 8 left. (32-24=8), he now give 0.625 of the remainder =0.625 x 8=5, if he had given 5 away that means he has 8-5=3 left. He then ate 1, which leaves him with just 2 left. So looks like we have calculated this correctly.

The following questions are called deductive maths questions and children are expected to think through using diagrams and word expressions to slowly analyse the question and look for clues in the questions and draw analogies which they will be able to work a solution out. It is envisaged that children will use

a) *Verbal Reasoning*
b) *Numerical reasoning*
c) *Diagrammatic reasoning*
d) *Logical reasoning including universal formulas.*
e) *Lateral thinking.*

1) **A, B and C are three numbers. The ratio of A to (B+C) is 2:6. The ratio of (A+B) to C is 8:2. Find the ratio of A to B to C. (Expected completion time= 5 minutes)**

The first thing to do is to find a common denominator this can be firstly reduced to 1:3 and 4:1

A	B	C	Ratio Denominator
1	3		4
4		1	5
Common denominator			20
5	15		
16		4	
5	11	4	20

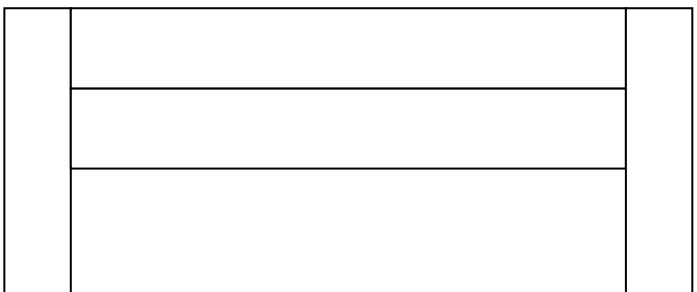
The Ratio of A to B to C- 5:11:4

2) **Find the value of 1+3+5+7.....35+37+39 (Expected time to complete 3 minutes)**

Answer: This is once again not difficult, you just have to know what to do using the correct method.

Step 1: Add 1 to the last number (39) and then divide the number by 2
1+39=40 then divide by 2= 20
Step 2: Square the Result
20 x 20= 400.

3) **The figure below is made up of 6 identical rectangles. The area of the figure 384 sq cm. Find the perimeter of the figure.**



Answer: if 6 squares = 384 sq cm, I rectangle is equivalent to 384 divided by 6=64

If you look at the figure it takes 4 breadths to equal 1 length if we translate that to a Ratio format,

You get Length x breadth is equivalent to 4 x 1

Length	x	Breadth	
4	x	1	=4
8	x	2	=8
12	x	3	=36
16	x	4	= 64

Therefore the perimeter is now made up of two lengths which is 16 x 4 + 4 x 4=64+16=80 cm

The perimeter of the figure is 80 cm.

4) Jackie Buckingham decides to drive from Jindabyne to Newcastle. The total journey is approximately 660 km away. At about 1030 am, Joseph her son starts the journey from Jindabyne to Newcastle travelling at approximately 60km/h. An hour later, Bruce Leaves town A for town B travelling at a speed of 70km/h. At what time would they catch up? **(5 to 8 minutes)**

This is a simple question to answer but one must be able to visualise the solution and understand the contents in the question. The best way to answer this question is to break down the question slowly and then approach it

Jackie Buckingham's son travels at 60kms per hour

Bruce travels at 70kms an hour, by drawing a graph in this manner we are able to see the distance travelled and the time to catch up, every hour that Bruce travels he travels 10kms closer to Joseph, you will see that at 1730 they would catch up.

While the problem may look difficult it is important that you write out the distance that each Joseph and Bruce travel and the time movement (per hour). Therefore the answer is 1730 where both of them will meet up.

	Time	1130	1230	1330	1430	1530	1630	1730	1830
Joseph	Distance	60	120	180	240	300	360	420	480
Bruce	Distance		70	140	210	280	350	420	
			10	10	10	10	10	10	

5) At Christmas the Griswalls decided to take a tour and drove their new Toyota Atara. So leaving their house at 1100, they left Canberra travelling at a constant speed, travelling toward Port Macquarie. 2 hours later, a second car a Holden Cruze left Canberra along the same route. The Holden Cruze overtook the Toyota Atara at 1600 hours. What we found out later was that the second car travelled faster than the Griswalls car at 40 km/h.

   1) Find the speed that the Griswalls were travelling.
   2) Find the distance between Canberra and Port Macquarie if the car was 80km from Port Macquarie at 1600 hours.
   3) How far was the Toyota Atara away from Port Macquarie when the Cruze reached Town B?

(This question looks rather complicated and may need to be slowly broken down and understood so that every aspect of the question can be understood before being answered- allocated time is below 10 minutes)

Answer: for Question 1 it is important to first see what information is available to us and the break this down,

The information that is available to us are as follows

1) They (the Griswalls) left at 1100 hours.

Two hours later (1300 hours) the second car in the Holden Cruze left.

The car (the Holden Cruze) overtook the car at 1600- which would be 3 hours later.

The Holden Cruze was driving faster by 40km per hour. Therefore it would have covered extra ground of 120kms in the 3 hours.

The Toyota Atara would be 120kms ahead at 1300 therefore the speed of the Atara was 120Kms divided by 2= 60km/h. (Answer for Questions 1)

2) Time from 1100 to 1600 is 5 hours. The distance travelled by lorry after 5 hours is 5 x 60kms = 300km.
Distance between Canberra and Port Macquarie= 300km+80km=380km
The speed of the car = 60km+40km=100km
Time taken to reach Port Macquarie from point where they overtook would be 80 divided by 100= 0.8 hours
0.8 hours x 60km = 48 km.

3) The distance to Port Macquarie = 80-48=32km (Answer)

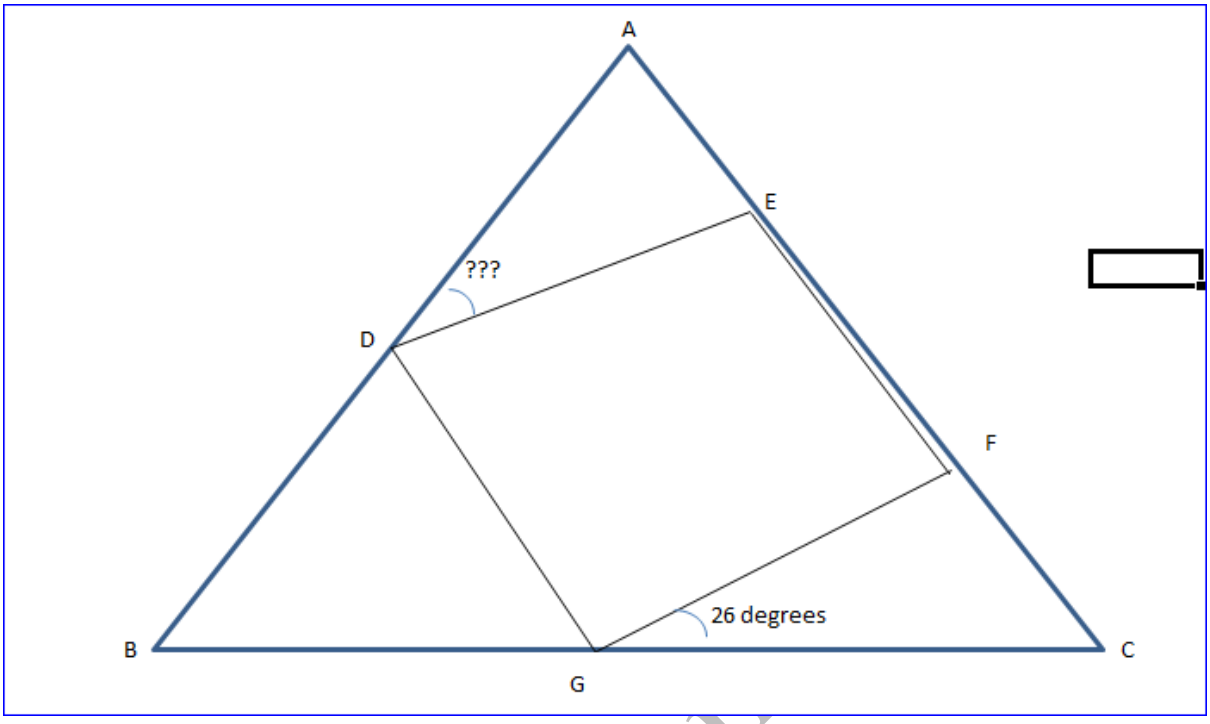
7. In the figure below, ABC is an Equilateral Triangle. DEFG is a Square within the triangle. Angle FGC is 26 degrees. Find the value of angle ADE.

To answer this question, we will need to find out what information is available to us,

Angle DGB-= 180-90-26=64 degrees (Angle on a straight line)

Angle BDG= 180-60-64=56

Angle ADE=180-90-56=34 degrees (Angle on a straight line)



6) Its Chinese New year, and Joseph Lim went to the market to purchase some food. He noticed that 3 chickens and 7 ducks cost $84.00. Also 8 chickens and 7 ducks cost $119. What is the price of 1 chicken? (5 mins)

This is called the Elimination method:

8 chickens and 7 ducks cost 119

3 chickens and 7 ducks cost 84

If we take the difference it is now equivalent to 5 chickens =$35.

Therefore 1 chicken is equivalent to $35/5= $7 a chicken.

7) Which of the following fractions is greater than 1/5 (3 minutes)

1) 2/11 2) 3/17 **3) 5/23** 40 6/31

If 1/5 =0.2 the number which is greater than 0.2 is equal to 5/23

8) Rihanna spent 3/8 of her savings on a IPAD Pro and ½ of her savings on a new diamond ring. If she spent a total of $560, how much was left in her savings?

We have to first understand the question and understand what they are looking for if she spent $560. That amount is equivalent to the amount she spent on her iPad and her diamond ring.

3/8+4/8 =7/8

So 7/8 is equivalent to $560.

8/8 is equivalent to 560/7 x 8=640

Now that we have what she originally had? The amount of money left is 640-560=$80.

9) Find the fraction that is exactly halfway between ¼ and 1/6

The first thing we need to do is to find the common denominator- in this case the common denominator is 24

¼ = 6/24

1/6=4/24

4/24.....(halfway value).....6/24

The answer is 5/24

The fraction which is halfway between ¼ and 1/6 is 5/24.