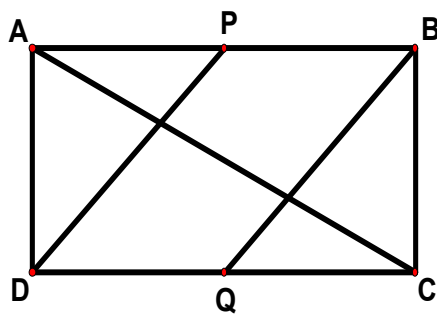


- 1 There is a triangle and a circle on a plane. Find the greatest number of regions that the plane can be divided into by the triangle and the circle.

-
- 2 The diagram shows a rectangle **ABCD**.
P and **Q** are the midpoints of **AB** and **CD** respectively.
What fraction of the rectangle is shaded?

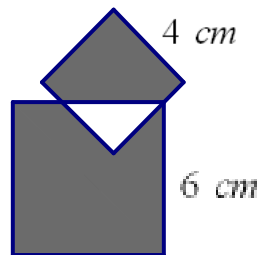


- 3 There is a glass of water and a glass of wine. A small amount of water is poured from the glass containing water into the glass containing wine. Then an equal amount of the wine - water mixture is poured back into the glass containing water.

Which one of the following statements is correct?

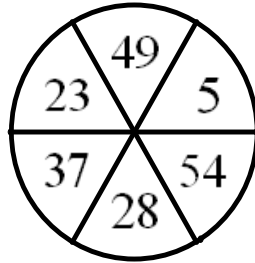
- (A) There is now more water in the wine than there is wine in the water.
(B) There is now less water in the wine than there is wine in the water.
(C) There is now an equal amount of water in the wine as there is wine in the water.
(D) It is uncertain whether there is more or less water in the wine than wine in the water.

-
- 4 Two squares, with lengths **4** cm and **6** cm respectively, are partially overlapped as shown in the diagram below. What is the difference between shaded area **A** and shaded area **B**?



- 5 The diagram shows a dartboard.

What is the least number of throws needed in order to get a score of exactly 100?



-
- 6 Find the value of $1 - \frac{5}{6} + \frac{7}{12} - \frac{9}{20} + \frac{11}{30} - \frac{13}{42} + \frac{15}{56} - \frac{17}{72} + \frac{19}{90}$.

7 Julia and Timothy each has a sum of money.

Julia's amount is $\frac{3}{5}$ that of Timothy's.

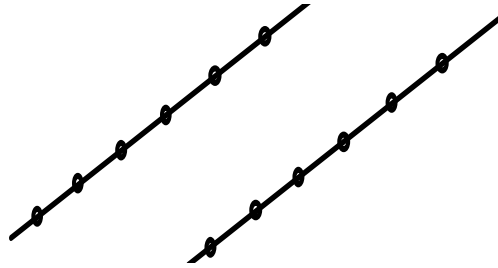
If Timothy were to give Julia \$168, then his remaining amount will be $\frac{7}{9}$ that of Julia's.

How much does Julia have originally?

8 When a number (the dividend) is divided by another number (the divisor), the quotient is 4 and the remainder is 8. Given that the sum of the dividend, the divisor, the quotient and the remainder is 415, find the dividend.

[*Note* : When 17 is divided by 3, the quotient is 5 and the remainder is 2 .]

- 9 Six different points are marked on each of two parallel lines.
Find the number of different triangles which may be formed using 3 of the 12 points.

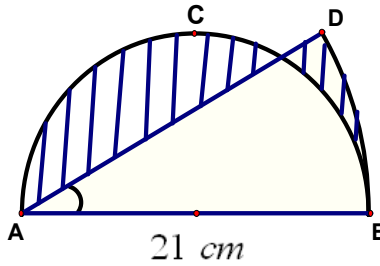


- 10 How long, in hours, after 12 noon, will it take for the hour hand of a clock to lie directly over its minute hand for the first time?

- 11** The lengths of two rectangles are 11 m and 19 m respectively.
Given that their total area is 321 m^2 , find the difference in their areas.
[Note : Both their widths are whole numbers.]

-
- 12** Lala speaks the truth only on Monday, Wednesday, Friday and Sunday.
Nana speaks the truth only on Monday, Tuesday, Wednesday and Thursday.
Find the day when both said "Yesterday I lied".

- 13 The diagram shows a semicircle **ACB** with diameter **AB** = 21 cm.
Angle **DAB** = 30° and arc **DB** is part of another circle with centre **A**.
Find the perimeter of the shaded region, using π as $\frac{22}{7}$.



- 14 Find the value of $20042005 \times 20052004 - 20042004 \times 20052005$.

-
- 15 In how many ways can $\frac{7}{12}$ be written as a sum of two fractions in lowest term given that the denominators of the two fractions are different and are each not more than 12?

-
- 16 There are 72 students in Grade 6.
Each of them paid an equal amount of money for their mathematics text books.
The total amount collected is \$ $\square 35.0 \square$, where two of the digits indicated with \square cannot be recognized.
How much money did **each** student pay for the books?

- 17** Numbers such as **1001**, **23432**, **897798**, **3456543** are known as palindromes.
If **all** of the digits **2**, **7**, **0** and **4** are used and each digit cannot be used more than twice, find the number of different palindromes that can be formed.

-
- 18** There are three classes **A**, **B** and **C**.
Class **A** has 2 more students than class **B**.
Class **B** has 1 more student than class **C**.
The product of the numbers of students in the three classes is **99360**.
How many students are there in class **A**?

19 Find the value of

$$1 + 2 + 2^2 + 2^3 \dots + 2^{11}.$$

[Note : $2^2 = 2 \times 2$, $2^3 = 2 \times 2 \times 2$]

20 Three boys **Abel**, **Ben** and **Chris** participated in a 100 m race.

When Abel crossed the 100 m mark, Ben was at 90 m.

When Ben crossed the 100 m mark, Chris was at 90 m.

By how many metres did Abel beat Chris?

[Note : They were running at constant speeds throughout the race.]

- 21** There are 5 students. Each time, two students are weighed, giving a total of 10 readings, in kilograms, as listed below :

103, 115, 116, 117, 118, 124, 125, 130, 137, 139.

What is the weight of the **third heaviest** student?

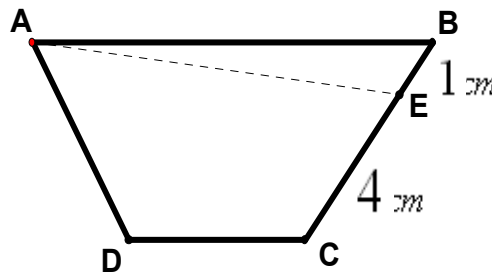
-
- 22** One pan can fry 2 pieces of meat at one time. Every piece of meat needs two minutes to be cooked (one minute for each side). Using only one pan, find the least possible time required to cook

(i) 2000,

(ii) 2005 pieces of meats.

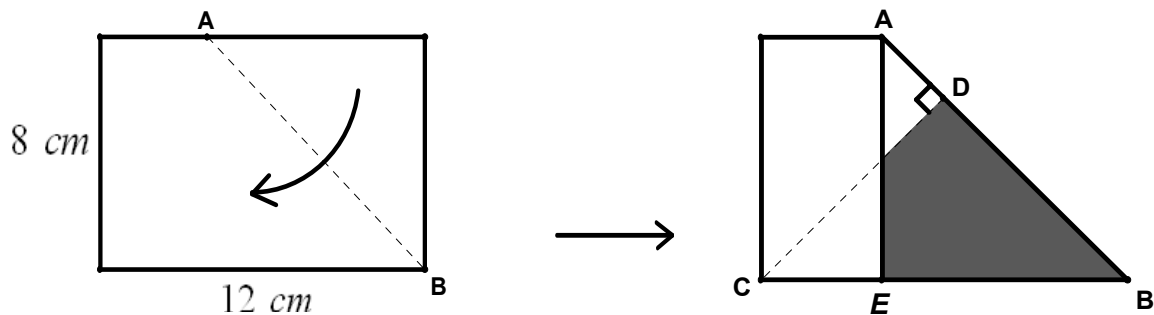
- 23** The distance between **A** and **B** is 7 km. At the beginning, both **Gregory** and **Catherine** are at **A**. Gregory walked from **A** to **B** at a constant speed. After Gregory had walked for 1 km, Catherine discovered that he had left his belongings at **A**. She immediately ran after him at a constant speed of 4 km/h. After handing over the belongings to Gregory, she turned back and started running towards **A** at the same speed. Given that both Catherine and Gregory reached **A** and **B** respectively at the same time, what was Gregory's speed?

- 24** The diagram shows a trapezium **ABCD**.
E is a point on **BC** such that $BE = 1$ cm and $EC = 4$ cm.
AE divides **ABCD** into two parts.
The areas of the two parts are in the ratio 1 : 6.
Find the ratio of the lengths **AB** : **DC**.



- 25** David's father picks him up from school every evening at 6 pm. One day, David was dismissed early at 5 pm. He walked home taking the same route that his father usually drives. When he met his father along the way he boarded the car and returned home 50 minutes earlier than usual. Given that his father drove at a constant speed and planned to reach the school at 6 pm sharp, how long, in minutes, had he walked before he was picked up by his father?

- 26** A piece of rectangular paper measuring 12 cm by 8 cm is folded along the dotted line **AB** to form the figure on the right. Given that **CD** is perpendicular to **AB**, find the area of the shaded region.



27 Four girls need to cross a dark narrow tunnel and they have only a torch among them.

Girl **A** can cross the tunnel in 1 minute.

Girl **B** can cross the tunnel in 2 minutes.

Girl **C** can cross the tunnel in 5 minutes.

Girl **D** can cross the tunnel in 10 minutes.

Given that they need a torch to cross at all times and that the tunnel can only allow two girls to go through at any given time, find the least possible time for the four girls to get across the tunnel.

[Note : The time taken by the slower girl is taken to be the time of each crossing.]

28 Which of the following is **true**?

(A) $\frac{10}{13} > \frac{11}{14}$,

(B) $\frac{4567}{6789} > \frac{3456}{5678}$,

(C) $\frac{12}{19} > \frac{20}{31}$,

(D) $\frac{111}{1111} > \frac{1111}{11111}$.

- 29** Mrs Wong is preparing gifts for the coming party.
 She buys 540 notepads, 720 pens and 900 pencils.
 The total cost of each type of stationery is equal.
 She divides the notepads equally in red gift boxes, pens equally in yellow gift boxes and pencils equally in blue gift boxes.
 She wishes that the cost of each gift box is equal and as low as possible.
 Find the **number of notepads** she needs to put in **each red gift box**.

- 30** Find the value of x in figure H.

A	B	C	D
1	2	3	4
E	F	G	H
11	43	150	x

END OF PAPER

Singapore Mathematical Olympiad for Primary Schools 2005
First Round – Answers Sheet

Question	Answers	For markers' use Only	Question	Answers	For markers' use Only
	Questions 1 to 10 each carries 4 marks		17	36	
1	8		18	48	
2	$\frac{1}{4}$		19	4095	
3	(c)		20	19 m	
4	20 cm ²			Q11 to Q20 total Sub-Score	
5	3			Questions 21 to 30 each carries 6 marks	
6	$\frac{3}{5}$		21	64 kg	
7	\$336		22	(i) 2000 mins (ii) 2005 mins	Both must be correct to score 6 marks
8	324		23	3 km/h	
9	180		24	5 : 2	
10	$\frac{1}{11}$ hours		25	35 mins	
	Q1 to Q10 total Sub-Score		26	28 cm ²	
	Questions 11 to 20 each carries 5 marks		27	17 mins	
11	211 m ²		28	(B)	
12	Friday		29	3	
13	65 cm		30	x = 666	
14	10000			Q21 to Q30 total Sub-Score	
15	3 ways				
16	\$8.82				