Class	Index Number	Name

ANG MO KIO SECONDARY SCHOOL
FINAL EXAMINATION 2011
SECONDARY ONE EXPRESS

MATHEMATICS
Part 1

MONDAY **10 OCTOBER 2011** **1 hour**

Candidates answer on the Question Paper.

Setter : Mr Eric Lee

READ THESE INSTRUCTIONS FIRST

Write your class, index number and name on all the work you hand in.
Write in dark blue or black pen in the spaces provided on the Question Paper.
You may use a pencil for any diagrams or graphs.
Do not use staples, paper clips, highlighters, glue or correction fluid.

Answer **all** questions.

The number of marks is given in brackets [ ] at the end of each question or part question.
If working is needed for any question it must be shown in the space below that question.
Omission of essential working will result in loss of marks.

If the degree of accuracy is not specified in the question and the answer is not exact, the answer should be given to three significant figures. Answers in degrees should be given to one decimal place.

The total of the marks for this paper is 50.

ELECTRONIC CALCULATORS CAN BE USED IN THIS PAPER.

For Examiner's Use
50

Downloaded from SingaKids.com

Part 1 (50 marks)
Answer ALL the questions.

1. Consider the seven numbers stated below.

$$1\ ,\ \frac{\pi}{11}\ ,\ \sqrt{43}\ ,\ -\sqrt{49}\ ,\ 31$$

Write down the

(i) integers,

(ii) prime numbers,

(iii) irrational numbers.

Ans: (i) _____ [1]

(ii) _____ [1]

(iii) _____ [1]

2. Express

(a) 0.010199 to 4 significant figures,

(b) 36 seconds as a percentage of 5 hours,

(c) 1.05% as a fraction in its lowest term.

Ans: (a) _____ [1]

(b) _____ % [1]

(c) _____ [1]

Downloaded from SingaKids.com

3. Arrange the following numbers in descending order

$\dot{0.9}$, $0.\dot{9}0\dot{9}$, 99% , $\frac{10}{11}$.

Ans: _____ [1]

4. Mr Ronnie competed in a triathlon of total distance 75 km. After finishing the 2 km swim segment in 1 h 15 min, he proceeded on to complete the cycling segment at a speed of 15 km/h in 1 h 48 min before finishing the whole race with the running segment at 9.2 km/h. Find

(i) the distance of the running segment,

(ii) his average speed for the whole journey in km/h.

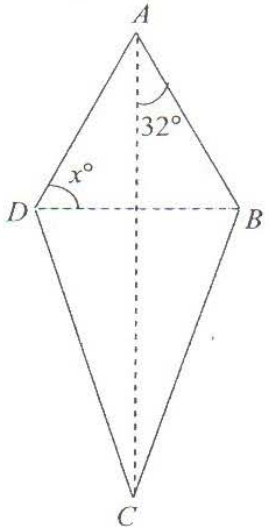
Ans: (i) _____ km [2]

(ii) _____ km/h [2]

Downloaded from SingaKids.com

5. (a) Find the smallest value of p, when $630p$ is a cube.

(b) In the figure shown, $ABCD$ is a kite. Find the value of $x°$.



Ans: (a) _____ [2]

(b) _____ [1]

6. (a) If $P:R = 5:11$ and $Q:R = 4:5$, find $P:Q:R$

(b) If the original cost of a teddy bear was \$200, find its price if it costs 12% less today.

Ans: (a) _____ [1]

(b) _____ [2]

Downloaded from SingaKids.com

7. If $x = -3$, $y = 4$ and $z = 1.5$, evaluate

(a) $x\left(y - z^2\right)$,

(b) $\dfrac{x}{yz}$.

Ans: (a) _____ [2]

(b) _____ [1]

8. (a) Simplify $2p - \left[3(q + 2p)\right]$.

(b) Solve the equation $2d + 3 = \dfrac{1}{3}(4d + 3)$.

Ans: (a) _____ [2]

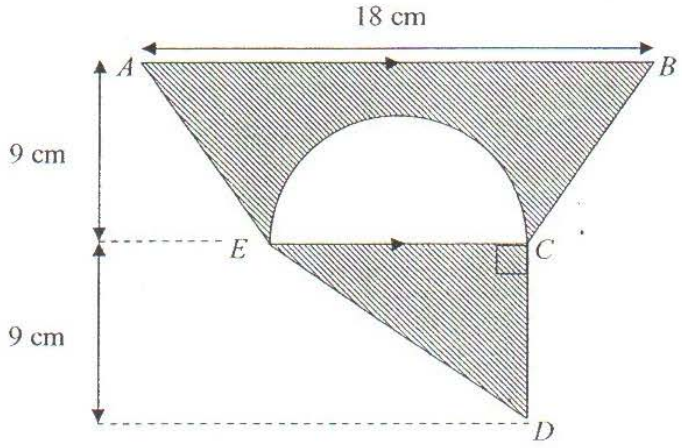
(b) _____ [3]

Downloaded from SingaKids.com

9. Charlie draws the following diagram during his art class. It consists of a semi-circle inside a trapezium with a right angled triangle at the bottom as shown in the figure. If the area of trapezium $ABCE$ is 144 cm^2, taking $\pi = \frac{22}{7}$, find

(i) CE,

(ii) the area of the shaded region.



Ans: (i) _____ cm [2]

(ii) _____ cm^2 [2]

Downloaded from SingaKids.com

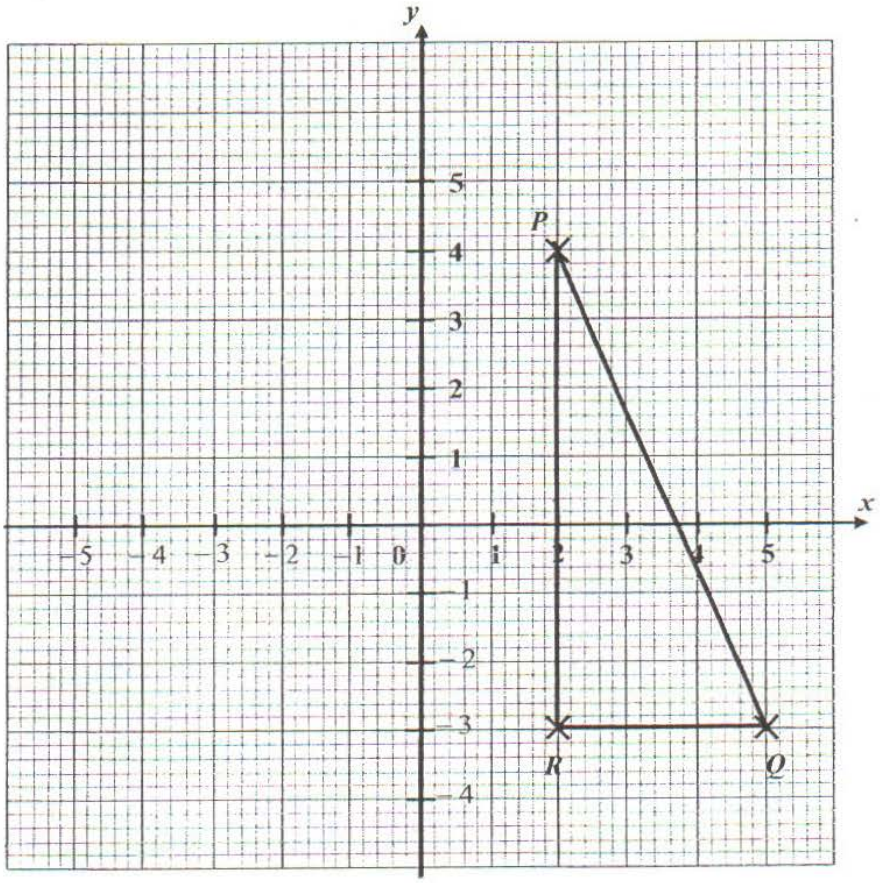
10. The graph below shows 3 points P, Q and R.

(a) Write down the gradient of PR.

(b) Write down the gradient of QR.

(c) Find the gradient of PQ.

(d) Write down the coordinates of point S such that $PQRS$ is a parallelogram.



Ans: (a) _____ [1]

(b) _____ [1]

(c) _____ [1]

(d) $S = (\quad , \quad)$ _____ [1]

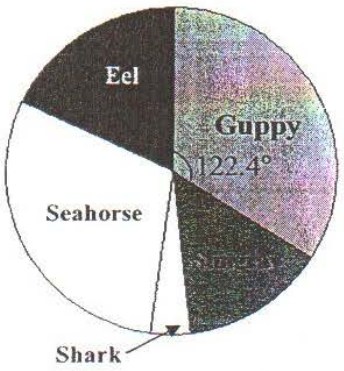
Downloaded from SingaKids.com

11. The pie chart shows the distribution of 150 fishes in an aquarium. Given that there are 45 seahorses and that there are as many eels as there are the total number of sharks and stingrays,

(i) find the number of guppies in the aquarium,

(ii) find the percentage of eels in the aquarium,

(iii) find the angle of the sector in the pie chart which represents the number of sharks if the ratio of sharks to stingrays is 2 : 7.



Ans: (i) _____ [1]

(ii) _____ % [2]

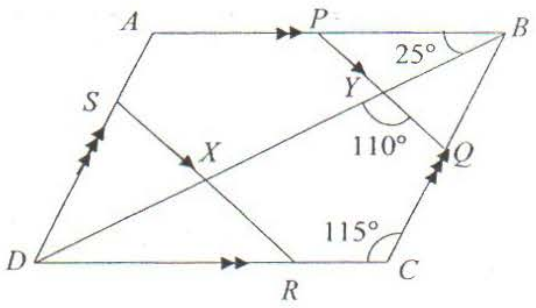
(iii) _____ [2]

Downloaded from SingaKids.com

12. In the diagram, $ABCD$ is a parallelogram with $\angle ABD = 25°$, $\angle DYQ = 110°$ and $\angle BCD = 115°$. Given that $PQ \,//\, SR$, calculate

(i) $\angle DRX$,

(ii) $\angle BQY$.



Ans: (i) _____ ° [3]

(ii) _____ ° [2]

Downloaded from SingaKids.com

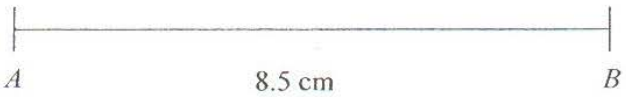
13. Construct triangle ABC such that $AB = 8.5$ cm, $\angle ABC = 65°$ and $BC = 7.7$ cm. The line AB has been drawn for you. [2]

(i) Measure and write down the length of AC.

(ii) Construct the perpendicular bisector of AB . The perpendicular bisector of AB cuts the line AB at a point P. Label point P. [2]

(iii) Construct the angle bisector of angle $\angle BAC$. [1]

(iv) Mark and label the point of intersection of the bisectors in part (ii) and (iii) with the letter Q. Measure and write down $\angle AQP$.



Ans: (i) $AC =$ _____ cm [1]

(iv) $\angle AQP =$ _____ ° [1]

End of Part 1

Downloaded from SingaKids.com

Secondary School Exam Papers

Powered by Testpaper.biz



Sec 1E Final Exam 2011 Mathematics Part 1

		Answer	Marking Scheme
1	(i)	$1, -\sqrt{49}, 31$	B1
	(ii)	31	B1
	(iii)	$\frac{\pi}{11}, \sqrt{43}$	B1
2	(a)	0.01020	B1
	(b)	0.2	B1
	(c)	$\frac{21}{2000}$ or 0.0105	B1
3		$\dot{0.9}, 99\%, 0.\dot{9}\dot{0}\dot{9}, \frac{10}{11}$	B1
4	(i)	Distance of running segment	
		$= 75-(2)-(15\times1.8)$	M1
		= 46 km	A1
	(ii)	Time taken for running $= \frac{46}{9.2} = 5h$	M1
		Ave speed $= \frac{75}{5+1.8+1.25}$	
		= 9.32 km/h or $9\frac{51}{161}$ km/h	A1
5	(a)	2 | 630 3 | 315 3 | 105 5 | 35 7 | 7 1 $630 = 2\times3^2\times5\times7$ $630k = 2\times3^2\times5\times7\times(2^2\times3\times5^2\times7^2)$ $k = (2^2\times3\times5^2\times7^2) = 14700$	M1 A1
	(b)	$x = 58°$	B1
6	(a)	P : Q : R 5 : 11 4 : 5 25 : 55 44 : 55 25 : 44 : 55	M1 A1 or B2
	(b)	100% - \$200 1% - \$2 88% - \$176	M1 A1

Downloaded from SingaKids.com

7	(a)	$-3(4-2.25)$ $=-5.25$	M1 A1
	(b)	$\frac{-3}{6}=-\frac{1}{2}$	B1
8	(a)	$2p-[3(q+2p)]$	
		$=2p-[3q+6p]$	M1
		$=-4p-3q$	A1
	(b)	$2d+3=\frac{1}{3}(4d+3)$	
		$2d+3=\frac{4}{3}d+1$	M1
		$\frac{2}{3}d=-2$	M1
		$d=-3$	A1
9	(i)	Area of trapezium $=\frac{1}{2}\times(AB+CE)\times Height$ $144=\frac{1}{2}\times(18+CE)\times 9$ $CE=14cm$	M1 A1
	(ii)	Area of triangle $CDE=\frac{1}{2}\times 14\times 9=63cm^2$ Area of semi – circle $=\frac{1}{2}\times\frac{22}{7}\times 7^2=77cm^2$ Area of shaded region = $63+(144-77)=130cm^2$	M1 A1
10	(a)	PR = undefined	B1
	(b)	$QR=0$	B1
	(c)	$PQ=\frac{4-(-3)}{2-5}$ $=-\frac{7}{3}$	B1
	(d)	$S=(-1\ ,4)$	B1
11	(i)	$\frac{122.4}{360}\times 150=51$	B1
	(ii)	Eels $=\frac{1}{2}(150-51-45)=27$ $\frac{27}{150}\times 100=18\%$	M1 A1
	(iii)	9 parts – 27 fishes 1 part – 3 fishes 2 parts – 6 fishes $\frac{6}{150}\times 360°=14.4°$	M1 A1

Downloaded from SingaKids.com

12	(i)	$\angle BDR = \angle ABD = 25°$ $\angle DXR = \angle DYQ = 110°$ $\angle DRX = 180° - 110° - 25° = 45°$	M1 M1 A1
	(ii)	$\angle YBQ = 180° - 115° - 25° = 40°$ $\angle BYQ = 180° - 110° = 70°$ $\angle BQY = 180° - 70° - 40° = 70°$	M1 A1
13		See separate file.	
	(i)	$AC = 8.8 \pm 0.1cm$	B1
	(ii)	See separate file.	
	(iii)	See separate file.	
	(iv)	See separate file.	
		$\angle AQP = 63° \pm 1°$	B1

Downloaded from SingaKids.com

ANG MO KIO SECONDARY SCHOOL
FINAL EXAMINATION 2011
SECONDARY ONE EXPRESS

MATHEMATICS
PART TWO

THURSDAY **6 OCTOBER 2011** **1 HOUR 15 MIN**

Name of Setter: Mr Muhammad Lewin Sim

Instructions to candidates:

1. Answer **ALL** the questions in Section A and Section B.

2. All relevant workings must be clearly shown.

3. Silent non-programmable calculators may be used.

4. If the degree of accuracy is not specified in the question and the answer is not exact, the answer should be given to three significant figures. Answers in degrees should be given to one decimal place.

5. The intended marks for the questions or parts of the questions are given in brackets [ ].

6. The total mark of this paper is **50**.

This Question Paper consists of 6 printed pages (including this page)

Downloaded from SingaKids.com

Section A (22 marks)
Answer ALL the questions

1. (a) Evaluate $\dfrac{(15.3)^2 + \sqrt{935}}{\binom{7}{9}^3}$ expressing your answer to 3 decimal places. [1]

   (b) Arrange the following numbers in **ascending** order.
   $\dfrac{2}{11}$, $0.\dot{1}8\dot{1}$, $\sqrt{0.0327}$, 0.4336^2 [1]

2. A cylindrical tank has a base radius 8 cm and height 18 cm. The depth of water in the tank is 10 cm. Taking $\pi = 3.14$, calculate

   (a) the total external surface area of the tank, [2]

   (b) how much more water is needed to fill the tank to the brim. [2]

3. (a) Solve the following equations

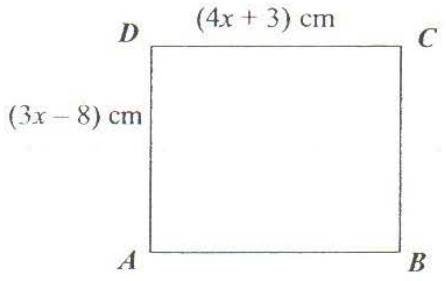
   (i) $7x + [9 - 2(x+8)] = 13$, [2]

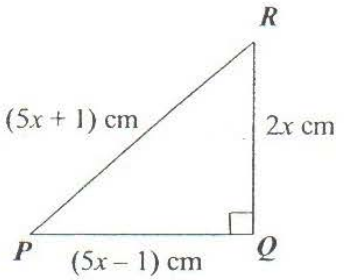
   (ii) $\dfrac{3x}{4} - 1 = \dfrac{2(x-1)}{5}$. [2]

   (b) Given $r = \dfrac{p}{p-q} + 2$, find the value of p if $q = 3$ and $r = 4$. [2]

Downloaded from SingaKids.com

4.





$ABCD$ is a rectangle which measures $(3x - 8)$ cm by $(4x + 3)$ cm. PQR is a right angled triangle in which $PQ = (5x - 1)$ cm, $QR = 2x$ cm and $PR = (5x + 1)$ cm.

(a) Given the perimeter of the rectangle $ABCD$ is equal to the perimeter of the triangle PQR, find the value of x. [3]

(b) Hence, find the area of triangle PQR [2]

5. Alex prepares 180 chicken wings, 240 sandwiches and 300 fish balls for a party. Assuming each guest eats the same quantity of each type of food,

(a) what is the largest number of guests he can invite, if no food of any kind is to be left over? [2]

(b) how many sandwiches are allocated for each guest? [1]

6. An article is advertised for $326.70 inclusive of 7% GST. Find the original price. [2]

Downloaded from SingaKids.com

Section B (28 marks)

Answer ALL the questions

7. Tom cycled for d km at a constant speed of 16 km/h and then walked for three-quarter of an hour to reach his destination. The total time taken for the whole journey was $\frac{d-3}{8}$ hours.

(a) Write down in terms of d, an expression for the time he spent cycling. [1]

(b) Form an equation in d and solve for d. [3]

(c) Hence, find in hours and minutes, to the nearest minute, the time taken for the whole journey. [1]

8. **Answer the whole of this question on a sheet of graph paper.**

The table below shows the corresponding x and y values for the equation $2x - y - 5 = 0$.

x	0	1	2	3	4
y	−5	−3	−1	p	3

(i) Find the value of p. [1]

(ii) Using a scale of 2 cm to represent 1 unit on both axes, draw the graph of $2x - y - 5 = 0$ for $0 \le x \le 5$. [3]

(iii) Draw and label the line $y = -1.5$. [1]

(iv) From the graph drawn, write down the coordinates of the point of intersection of $y = -1.5$ and $2x - y - 5 = 0$. [1]

9. (a) Simplify $2\frac{1}{4} : 0.02 : 5^2$ [1]

(b) A polygon has n sides. Two of its exterior angles are $48°$ and $81°$ while the remaining exterior angles are each equal to $21°$. Find the value of n. [2]

Downloaded from SingaKids.com

10. A salesman at *Young Heart Jewellery* recorded the number of customers who visited his shop each day for 30 days. His records are as follows:

Number of customers per day at shop									
9	6	7	8	8	12	7	9	8	10
11	12	7	9	8	10	11	10	6	11
7	10	6	7	9	7	8	8	10	8

(a) Represent the data by drawing a frequency table with tally. [2]

(b) What is the most frequent number of customers per day? [1]

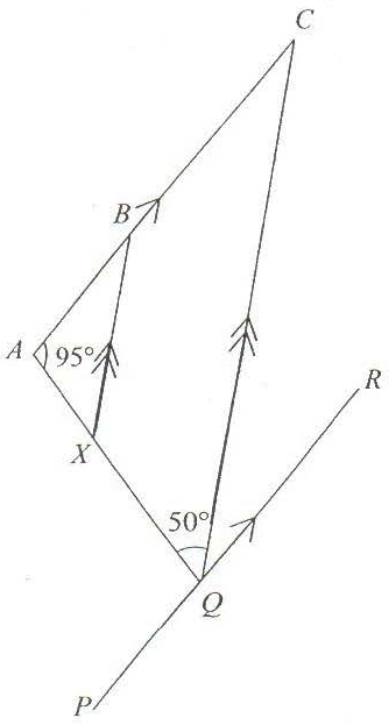
(c) What fraction of the days of the month saw 8 or more customers at the shop? [1]

11. In the diagram, AC is parallel to PR and XB is parallel to QC.
Given that $\angle BAX = 95°$ and $\angle AQC = 50°$, find

(a) reflex $\angle AQC$, [1]

(b) $\angle CQR$, [1]

(c) $\angle ABX$. [2]



Downloaded from SingaKids.com

12. A simple ornamental lamp consisting of a triangular prism with a cube as the base, is shown in *Figure I*.

The lamp uses a special cylindrical light bulb consisting of an enclosed glass envelope with a metal base, shown in *Figure II*. (Take $\pi = \frac{22}{7}$)

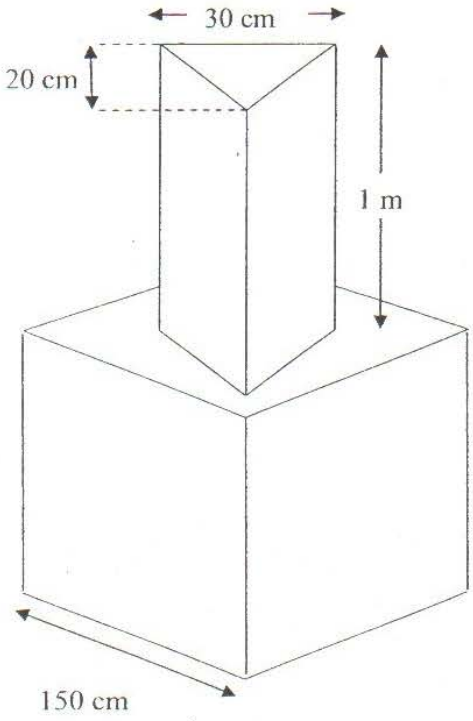


Figure I

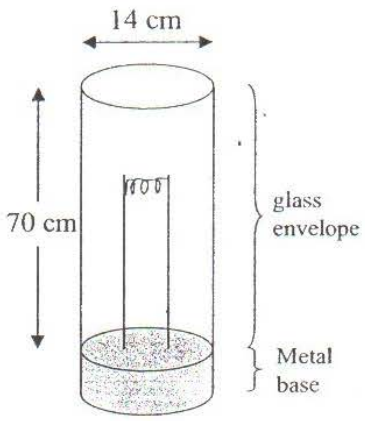


Figure II

(a) Find the volume of the ornamental lamp. Express your answer in m^3. [3]

(b) Find the total surface area of the glass envelope of the special cylindrical light bulb in cm^2. [3]

End of Paper

Downloaded from SingaKids.com

Secondary School Exam Papers

Powered by Testpaper.biz



1. (a) 562.515 [B1]

(b) $\sqrt{0.0327}$, $0.\dot{1}8\dot{1}$, $\frac{2}{11}$, 0.4336^2 [B1]

2 (a) $TSA = 3.14 \times 8 \times 8 + 2 \times 3.14 \times 8 \times 18$ [M1]

$= 1105.28\,cm^2$ [A1]

(b) $Volume = 3.14 \times 8 \times 8 \times 8$ [M1]

$= 1607.68 cm^3$ [A1]

3. (a) (i) $7x + [9 - 2(x+8)] = 13$

$7x + 9 - 2x - 16 = 13$ [M1]

$5x = 20$

$x = 4$ [A1]

$\frac{3x}{4} - 1 = \frac{2(x-1)}{5}$

$\frac{15x - 8(x-1)}{20} = 1$ [M1]

(ii) $\frac{15x - 8x + 8}{20} = 1$

$7x + 8 = 20$

$7x = 12$

$x = 1\frac{5}{7}$ [A1]

(b) $4 = \frac{p}{p-3} + 2$

$2 = \frac{p}{p-3}$ [M1]

$2p - 6 = p$

$p = 6$ [A1]

4 (a) $2(4x+3) + 2(3x-8) = 5x + 1 + 5x - 1 + 2x$ [M1]

$8x + 6 + 6x - 16 = 10x + 2x$ [M1]

$2x = 10$

$x = 5$ [A1]

(b) $\frac{1}{2} \times 24 \times 10$ [M1]

$= 120 cm^2$ [A1]

Downloaded from SingaKids.com

5. (a) $180 = 2^2 \times 3^2 \times 5$

$240 = 2^4 \times 3 \times 5$ [M1]

$300 = 2^2 \times 3 \times 5^2$

HCF $= 2^2 \times 3 \times 5 = 60$ [A1]

(b) $240 \div 60 = 4$ [B1]

6. $\frac{326.70}{107} \times 100$ [M1]

$= \$305.33$ [A1]

7. (a) $\frac{d}{16}h$

Or $\frac{d-9}{8}$ [B1]

Or $\frac{d-3}{8} - \frac{3}{4}$

(b) $\frac{d}{16} + \frac{3}{4} = \frac{d-3}{8}$ [M1]

$\frac{d+12}{16} = \frac{d-3}{8}$

$8(d+12) = 16(d-3)$ [M1]

$8d + 96 = 16d - 48$

$d = 18$ [A1]

(c) 1 Hour 53 minutes [B1]

8. (i) $p = 1$

(ii)

(iii)

(iv) $(1.75, -1.5)$ [B1]

$(1.75 \pm 0.05, -1.5)$

9. (a) $225 : 2 : 2500$ [B1]

(b) $360 - 48 - 81 = 231°$ [M1]

$\frac{231}{21} = 11$

$n = 13$ sides [A1]

Downloaded from SingaKids.com

10.

(a)

No of Customers	No of days	Tally
6	3	
7	6	
8	7	
9	4	
10	5	
11	3	
12	2	

(b) 8 [B1]

(c) $\frac{21}{30}=\frac{7}{10}$ [B1]

11. (a) $\angle AQC = 360 - 50$

$= 310°$ (Angles@a point) [B1]

(b) $\angle CQR = 180 - 95 - 50$ (int angles)

$= 35°$ [B1]

(c) $\angle ACQ = 180 - 50 - 95$ ($\angle s$ sum of Δ)

$= 35°$ [M1]

$\angle ABX = \angle ACQ$ (Corres $\angle s$)

$= 35°$ [A1]

12. (a) Volume $= 1.5 \times 1.5 \times 1.5$ [M1]

$+\frac{1}{2} \times 0.3 \times 0.2 \times 1$ [M1]

$= 3.405 m^3$ [A1]

(b) TSA $= \frac{22}{7} \times 7 \times 7 + 2 \times \frac{22}{7} \times 7 \times 70$ [M1]

$= 154 + 3080$ [M1]

$= 3234 cm^2$ [A1]

Downloaded from SingaKids.com