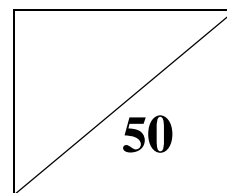


Secondary One Express Mathematics

End of Year Examination (Set 2)

Paper 2



1. A rectangular piece of Styrofoam sheet measuring 360 cm by 280 cm is cut into identical small squares such that Styrofoam was left. The length of the side of each small square is the largest possible length. Find
 - (a) the length of the side of each small square, [3]
 - (b) the number of squares cut out. [1]

2. Lester drove his car from City *A* to City *B* at an average speed of 40 km/h for $\frac{x}{2}$ hr and from City *B* to City *C* at an average speed of 60 km/h for $\frac{2x-1}{3}$ hr.
 - (a) Express, in terms of x , the distance travelled from City *A* to City *B*. [1]
 - (b) Express, in terms of x , the distance travelled from City *B* to City *C*. [1]
 - (c) Express, in terms of x , the total distance travelled by Lester. [1]
 - (d) Find the value of x if the total distance travelled is 340 km. [2]
 - (e) Find the distance between City *B* and City *C*. [1]

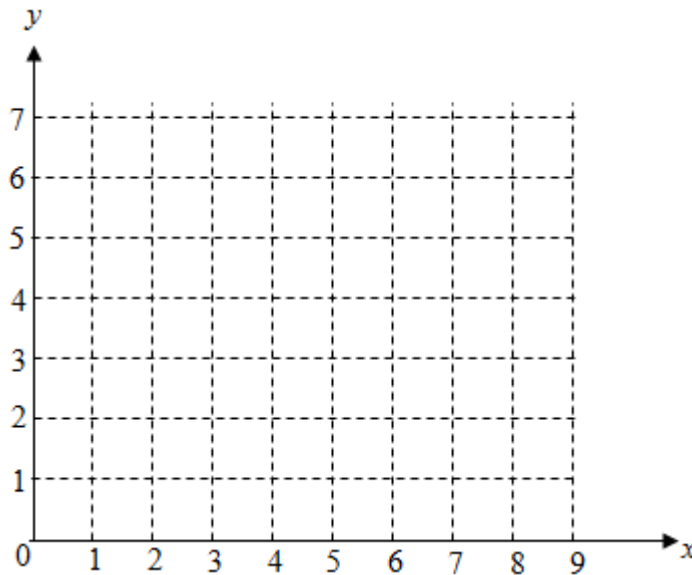
3. Expand and simplify the following:
 - (a) $-6(7k^2)$ [1]
 - (b) $13(2a+3b)$ [1]
 - (c) $(x+2)(9x-7)$ [1]

4.
 - (a) Simplify algebraic expression $-4(a+b)+[a-2(b-a)]$. [2]
 - (b) Solve $\frac{2x-3}{6}-\frac{3x-4}{8}=-1$. [3]

5. (a) Complete the following table for the equation $y = 4 - \frac{1}{2}x$. [2]

x	0	4	8
y		2	

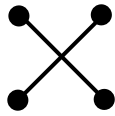
(b)



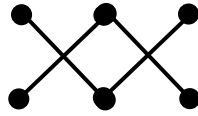
Draw the straight line $y = 4 - \frac{1}{2}x$ on the diagram provided. [2]

- (c) Write down the y-intercept. [1]
 (d) Draw a straight line $y = 3$ on the same diagram. [1]
 (e) Write down the co-ordinates of the point of intersection of the two lines. [1]
6. (a) Construct a quadrilateral $ABCD$ in which $AB = 8.3$ cm, $BC = 5.5$ cm, $CD = 9.2$ cm, $\angle ABC = 90^\circ$ and $\angle BCD = 70^\circ$. [3]
 (b) Using a ruler, find the length of AD . [1]
 (c) Using a protractor, find $\angle BAD$ and $\angle ADC$. [2]
 (d) Classify $\triangle ABC$ according to the type of angles it has. [1]

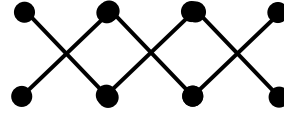
7. A sequence of patterns formed by dots and lines are shown below.



Pattern 1



Pattern 2



Pattern 3

(a) Find the number of dots

(i) in the 5th pattern,

[1]

(ii) in the n^{th} pattern.

[1]

(b) Pattern n has 288 dots. Find the value of n .

[2]

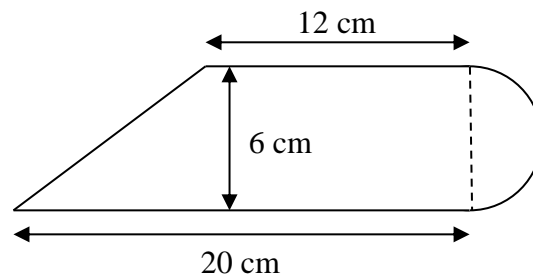
8. The diagram shows the shape of the cross-section of an eraser which is made up of a semicircle and a trapezium.. Calculate the

(a) area and

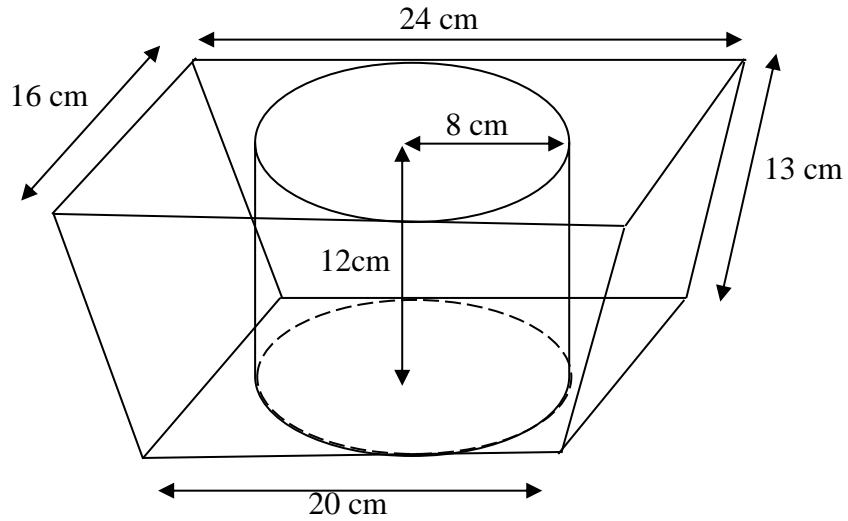
[3]

(b) perimeter of the figure.

[3]



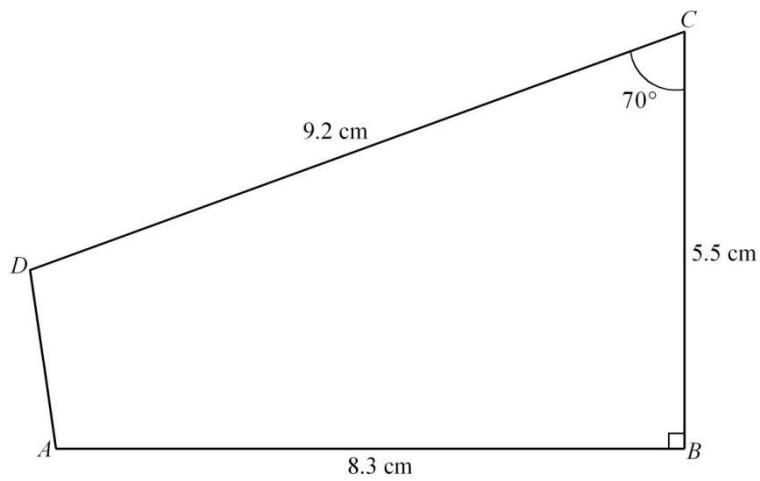
9. A cylindrical container (hollow) of radius 8 cm and a height of 12 cm is mounted in a wooden prism solid with the same height as shown in the diagram below.



Calculate,

- (a) the volume of the cylindrical container, leaving your answer in 3 decimal places, [2]
- (b) the volume of wood used in the solid, [3]
- (c) the total surface area of the wooden solid (exclude inner cylinder). [3]

solution for construction



- (b) By measurement, $AD = 2.4$ cm
- (c) By measurement, $\angle BAD = 100^\circ$, $\angle ADC = 100^\circ$
- (d) $\triangle ABC$ is a right-angled triangle.

M

Set 2**Mark Scheme Sec 1 End of Year Examination**

Question	Method	Marks
1a	Finding HCF of 360 and 280 HCF = 40	[M1] [A1]
1b	$360 \div 40 = 9$ $280 \div 40 = 7$ $9 \times 7 = 63$ 63 squares are cut out.	[M1] [A1]
2a	Distance = $20x$	[B1]
2b	Distance = $60\left(\frac{2x-1}{3}\right) = 40x - 20$	[B1]
2c	Total Distance = $40x - 20 + 20x = 60x - 20$	[B1]
2d	$60x - 20 = 340$ $\therefore x = 6$	[M1] [A1]
2e	Distance = $40(6) - 20 = 220$ km	[B1]
3a	$-6(7k^2) = -42k^2$	[B1]
3b	$13(2a + 3b) = 26a + 39b$	[B1]
3c	$(x+2)(9x-7) = 9x^2 + 11x - 14$	[B1]
4a	$-4(a+b) + [a - 2(b-a)] = -4a - 4b + (a - 2b + 2a)$ $= -4a - 4b + 3a - 2b$ $= -a - 6b$	[M1] [A1]
4b	$\frac{2x-3}{6} - \frac{3x-4}{8} = -1$ $\frac{4(2x-3) - 3(3x-4)}{24} = -1$ $8x - 12 - 9x + 12 = -24$ $-x = -24$ $x = 24$	[M1] [M1] [A1]

5a	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="padding: 2px;">x</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">4</td> <td style="padding: 2px;">8</td> </tr> <tr> <td style="padding: 2px;">y</td> <td style="padding: 2px;">4</td> <td style="padding: 2px;">2</td> <td style="padding: 2px;">0</td> </tr> </table>	x	0	4	8	y	4	2	0	[B2]
x	0	4	8							
y	4	2	0							
5b		[B1] correct y-int [B1] correct x-int								
5c	(0, 8)	[B1]								
5d		[B1]								
5e	(2, 3)	[B1]								
6a		[B1] Construction arcs shown for BC [B1] Construction arcs shown for BC [B1] correct diagram								
6b	By measurement, $AD = 2.4$ cm	[B1]								
6c	By measurement, $\angle BAD = 100^\circ$, $\angle ADC = 100^\circ$	[B1]								
6d	$\triangle ABC$ is a right-angled triangle.	[B1]								

7ai	12	[B1]
7aii	$T_n = 4 + (n-1)(2)$ $= 2n + 2$	[B1]
7b	$2n + 2 = 288$ $n = 143$	[M1] [A1]
8a	<p>Area trapezium = $\frac{1}{2} \times (12 + 20)(6) = 96 \text{ cm}^2$</p> <p>Area Semi circle = $\frac{1}{2} \times \pi (3^2) = 9/2 \pi$</p> <p>Total area = $9/2 \pi + 96$ $= 110.139 \text{ cm}^2$ $= 110 \text{ cm}^2$ (3 sf)</p>	[M1] [M1] [A1]
8b	<p>Circumference of semi circle = $\frac{1}{2} (\pi D) = \frac{1}{2} \pi (6) = 3\pi \text{ cm}$</p> <p>Perimeter = $10 + 12 + 3\pi + 20$ $= 51.426 \text{ cm}^2$ $= 51.4 \text{ cm}^2$</p>	[M1] [M1] [A1]
9a	<p>Volume = $\pi (8^2)(12)$ $= 768\pi \text{ cm}^3$ $= 2413.056 \text{ cm}^3$ $= 2410 \text{ cm}^3$ (to 3 s.f.)</p>	[M1] [A1]
9b	<p>Total base area = $\frac{1}{2} (24 + 20)(12) = 264 \text{ cm}^2$</p> <p>Volume of trapezoidal prism = $264 \times 16 = 4224 \text{ cm}^3$</p> <p>Volume of wood used = $4224 - 2413.056$ $= 1810.944$ $= 1810 \text{ cm}^3$</p>	[M1] [M1] [A1]