Secondary One Express Mathematics

End of Year Examination Paper 2

Marks	50

1. At the start of an experiment, the temperature of a gas was 38°C. After 7 minutes, the temperature of the gas had fallen to $-4°C$.

   (a) Calculate the change in temperature of the gas after 7 minutes from the start of the experiment. [1]

   (b) Given that the cooling rate of the gas remains constant, find the temperature of the gas 8.5 minutes after the start of the experiment. [2]

2. Alan took part in a community walk/run event.

   (a) He first ran 2 km at an average speed of 5 km/h. Find the time, in hours, which Alan ran. [1]

   (b) He then walked for 1 hour and 12 minutes at an average speed of 4 km/h. Find the distance Alan walked. [2]

   (c) Find Alan's average speed for the whole event in km/h. [2]

3. A salesman receives a basic salary of $ 650 monthly. In addition, he will receive a commission of 2 % of the total amount of sales he made in that month. Given that 20% of his total monthly salary is contributed into his CPF account. Find

   (a) the total amount of sales he made for May if he received a commission of $ 70 for that month, [2]

   (b) the total amount of salary he received in May, after the CPF deduction. [2]

4. Factorise completely:

   (a) $5r + ar + 5m + am$ [2]

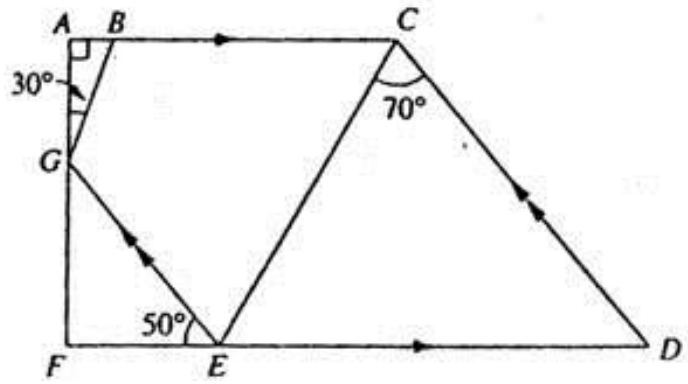
   (b) $8px - 15ay - 6py + 20ax$ [2]

5. Solve the following equations:

   (a) $5x - 2(2x + 1) = 2(x - 1) - 14$. [2]

   b) $2x - \frac{3}{4} = \frac{1}{3}x + \frac{5}{6}$ [2]

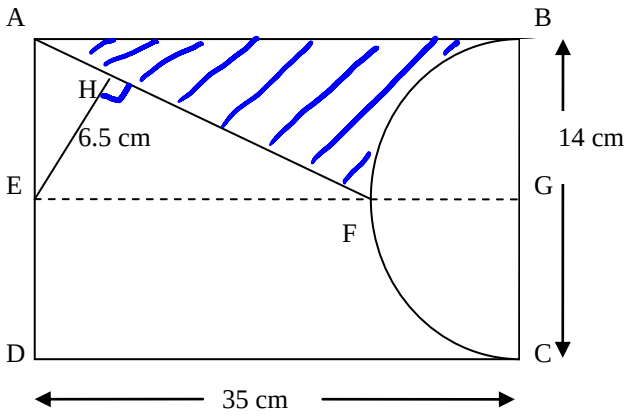
6. In the diagram, *ACDF* is a trapezium and *CD* // *GE*. $\angle BAG = 90°$, $\angle AGB = 30°$, $\angle FEG = 50°$ and $\angle DCE = 70°$.



(a) Stating all your reasons clearly, find $\angle BGE$. [2]

(b) Explain why *BG* is parallel to *CE*. [1]

7. In the figure below, *ABCD* is a rectangle and *BFC* is a semicircle with point *G* as the centre of the semicircle. Point *E* is at the mid point of *AD* and point *F* is at the mid point of the arc of the semi circle. *EFG* is parallel to *AB* and *DC*. *DC* = 35 cm, *BC* = 14 cm and *EH* = 6.5 cm.



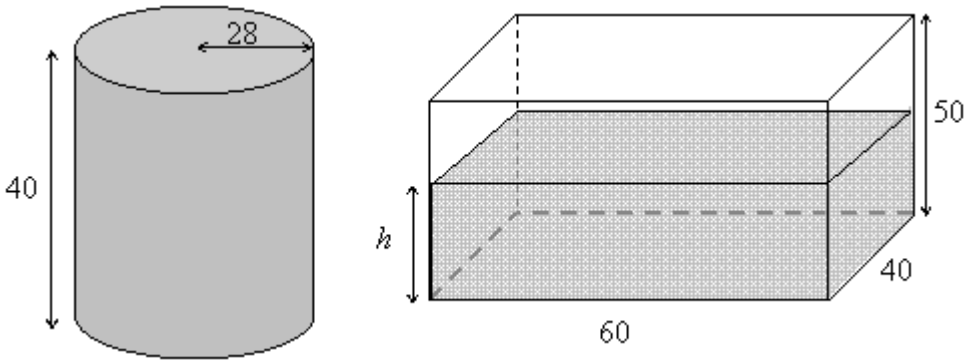
(a) Find the area of the triangle AEF. [1]

(b) Find the shaded area ABF. [2]

(c) Calculate the length AF. [1]

(d) Calculate the perimeter of the shaded area ABF. [2]

8. The figure shows a cylindrical and rectangular tank with dimensions given in metres.



Take $\pi = 3.142$

(a) Find the volume of the cylindrical tank. [2]

(b) The cylindrical tank is completely filled with water. If the water is poured into the rectangular tank, find the height of the water in the rectangular tank. [2]

(c) The cylinder is to be wrapped with aluminium foil except for the top of the cylinder. Calculate the amount of aluminium foil that is needed. [3]

9. Answer the whole of this question on a sheet of plain paper.

(a) Construct a triangle ABC such that $AB = 15$ cm, $AC = BC = 9$ cm. Draw the side AB as the base of the triangle. [1]

(b) Measure the $\angle CAB$. [1]

(c) Construct the bisector of $\angle ABC$. [1]

(d) Construct the perpendicular bisector of the side AB. [1]

(e) The 2 lines in (c) and (d) meet at the point X. Measure and write down the length of BX. [1]

10. Answer the whole of this question on a graph paper.

The table below gives some values of x and the corresponding values of y, where $y = -2x - 1$.

X	-3	-1	0	1	2	3
Y	5	a	-1	b	-5	-7

[1]

(a) Find the values of a and b.

(b) Using a scale of 2 cm to 1 unit, draw a horizontal x-axis for $-3 \leq x \leq 3$.
Using a scale of 1 cm to 1 unit, draw a vertical y-axis for $-8 \leq y \leq 6$.
On your axes, plot the points given in the table and join them with a straight line. [3]

(c) Using your graph,

(i) find the value of y when $x = 0.5$, [1]

(ii) show that the gradient of the line is -2 [2]

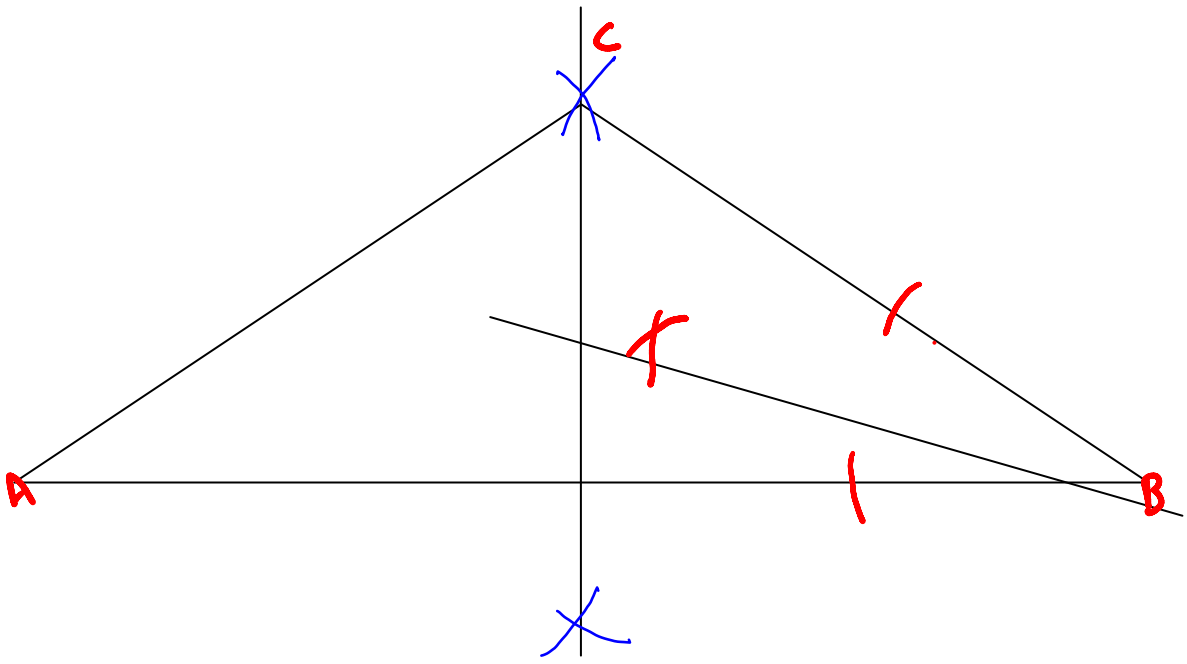
(d) On the same axes, draw the graph of
(i) $y = -3$, [1]
(ii) $x = 2$. [1]

ANSWERS

1a)	42	B1
b)	7 mins $\rightarrow$ 42°	
	8.5 mins $\rightarrow$ 51°	M1
	38 – 51 = -13 °	A1
2a)	0.4 hr	B1
b)	$4 \times 1\frac{12}{60}$	M1
	= 4.8 km/h	A1
c)	$\frac{4.8+2}{1.2+0.4}$	M1
	= 4.25	A1
3a)	$\frac{70}{2} \times 100\%$	M1
	= 3500	A1
b)	80% x (70 + 650)	M1
	= 576	A1
4a)	r(5+a) + m(5+a)	M1
	= (5+a) (r+m)	A1
b)	4x (2p+5a) – 3y (5a+2p)	M1
	= (5a+2p) (4x – 3y)	A1
5	$5x - 4x - 2 = 2x - 2 - 14$	M1
	x = 14	A1
b)	$\frac{24x}{12} - \frac{9}{12} = \frac{4x}{12} + \frac{10}{12}$	M1
	$x = \frac{19}{20}$	A1
6.a)	CDE = 50 ° (corresponding angles)	
	BGE = 90 + 50 -30 (exterior angles of a triangle)	M1
	= 110°	A1
b)	< BCE = <ABG =60 ° (Corresponding angles)	B1

7a)	98	B1
b)	$(7\times35)-98-\frac{1}{4}(3.142)(7\times7)$	M1
	= 245 – 98- 38.4895	
	= 108.5 = 109	A1
c)	½ x AF x 6.5 = 98	M1
	AF = 30.153	A1
d)	35 + 30.153 + ¼ (2 x 3.142x7)	M1
	=35 + 30.153 + 10.995	
	= 76.148 = 76.1	A1
8a)	(3.142 x 28 x 28) x 40	M1
	= 98 533	A1
b)	98 533 = 60 x 40 x h	M1
	h = 40.1	A1
c)	Curved surface area = 3.142 x 28 x 2 x 40 = 7 038.08	M1
	Bottom surface area = 3.142 x 28 x 28 = 2 4 63	M1
	Total surface area = 9 501	A1

9.



Construction of triangle with appropriate arcs B1
Construction of angle bisector with appropriate arcs B1
Construction of perpendicular bisector with appropriate arcs B1

< CAB = 34 ° B1
BX = 7.8 cm B1

10.a) a = 1, b = -3 B1

b) Correct scales on y axis B1
Correct scales on x axis B1
Points plotted correctly and graph drawn acurrately B1

c) i) y = -2 A1

ii) Gradient = $\frac{5-(-7)}{-3-3}$ M1

$= \frac{12}{-6}$

$= -2$ A1