SEKOLAH BUKIT SION

IGCSE Mock Examination 2021

MARKING SCHEME
0580 MATHEMATICS (PAPER 2B)

YEAR 10/11
8 APRIL 2021
8.00 – 9.30 (90 minutes)

70 marks

1   27   28   29   30   31   32   33

	Answer	Marks	Notes
(a)	28	1	cao
(b)	27	1	cao
(c)	29 or 31	1	Or both seen If extra answer is wrong, **B0**

2   Factorise completely.

   (a) $15p^2q^2 - 25q^2$
   (b) $k^2 - 24k + 144$
   (c) $4fg + 6gh + 10fk + 15hk$

|			
(a)	$5q^2(3p^2 - 5\ )$	2	**B1** Partial Factorisation or Either factor is correct
(b)	$(k - 12)(k - 12)$ or $(k - 12)^2$	2	**B1** $(k + a)(k + b)$ where $ab = 144$

(c)	$(2f + 3h)(2g + 5k)$	2	**B1** Partial Factorisation
			   $2g(2f + 3h) + 5k(2f + 3h)$ or
			   $2f(2g + 5k) + 3h(2g + 5k)$

3 $f(x) = x^3$ $g(x) = 5x + 2$

   (a) Find gf(x).
   (b) Find fg(x).
   (c) Find g^{-1}(x), the inverse of g(x).

(a)	$5x^3 + 2$	1	
(b)	$(5x + 2)^3$	1	
(c)	$\frac{x-2}{5}$ oe	2	**M1** correct first step $\frac{y}{5} = x - \frac{2}{5}$ or $y - 2 = 5x$ or $x = 5y + 2$

2

4 40 children were asked if they have a computer or a phone or both.
The Venn diagram shows the results.
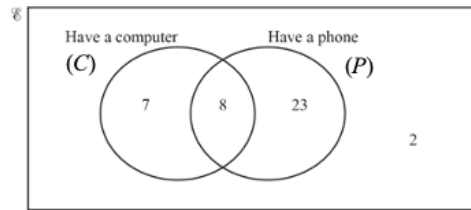
(a) A child is chosen at random from the children who have a computer.
Write down the probability that this child also has a phone.

(b) Find n$((C \cap P)' \cap P)$.

(a)	$\dfrac{8}{15}$	1	cao
(b)	23	1	cao

5 A is the point $(7, 12)$ and B is the point $(2, -1)$.
Find the length of AB.

	$\sqrt{(12--1)^2 + (7-2)^2}$ oe	2	**M1** for $(12--1)^2 + (7-2)^2$ oe
	13.9 (3sf for non-exact answers)	1	

6 A cuboid has width 6 cm, height 9 cm and volume 675 cm³.
(a) Calculate the length of this cuboid.
(b) If water is poured into the cuboid at a rate of 25 cm³ per minute,
how long, in hours, does it take to fill in the cuboid with water to the brim?

(a)	$\dfrac{675}{5 \times 9}$	1	
	12.5	1	
(b)	$\dfrac{675}{25} = 27$ minutes	2	cao
	$\dfrac{9}{20}$ h $= 0.45$ hours	1	

7 Find the area of triangle ABC.

NOT TO SCALE

1.6 m

2.8 m
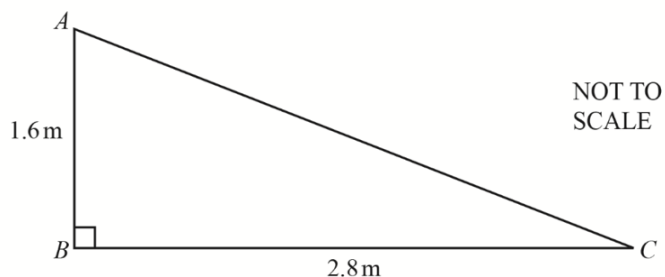
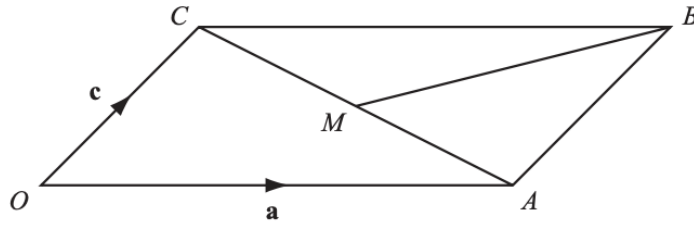| $\frac{1}{2} \times 1.6 \times 2.8$	1	
2.24	1	

8 Write down the equation of the line perpendicular to the line $y = \frac{1}{2}x + 1$ and passes through the point (1, 3).

Gradient of perp. line = -2	1	
$3 = -2(1) + c$ $c = 5$	1	
$y = -2x + 5$	1	

9 Solve the equation $3x^2 - 2x - 10 = 0$.
Show all your working and give you answers correct to 2 decimal places.

$\dfrac{[--]2 \pm \sqrt{([-]2)^2 - 4(3)(-10)}}{2 \times 3}$ oe	2	**B1** for $\sqrt{([-]2)^2 - 4(3)(-10)}$ **B1** for $\frac{[--]2+\sqrt{q}}{6}$ or $\frac{[--]2-\sqrt{q}}{6}$
2.19 and −1.52	2	**If 0 marks:** **SC1** for 2.2 and −1.5 or 2.189 and −1.523

4

10

OABC is a parallelogram.
$\overrightarrow{OA}$ = **a**, $\overrightarrow{OC}$ = **c** and *M* is the midpoint of *CA*.

Find in terms of **a** and **c**

(a) $\overrightarrow{OB}$
(b) $\overrightarrow{CA}$
(c) $\overrightarrow{BM}$

(a)	$\overrightarrow{OB}$ = **a** + **c**	1	
(b)	$\overrightarrow{CA}$ = **a** − **c**	1	
(c)	$\overrightarrow{AM}$ = ½ **c** - ½ **a** $\overrightarrow{BM}$ = - ½ **c** - ½ **a**	1 1	

11   Minnie invests $5720 at a rate of 2.5% per year compound interest.

Calculate the **total** amount Minnie has after 3 years.

$5720\left(1+\frac{2.5}{100}\right)^3$ oe	2	**M1** $5720\left(1+\frac{2.5}{100}\right)^2$
6160 or 6159.81	1	

12
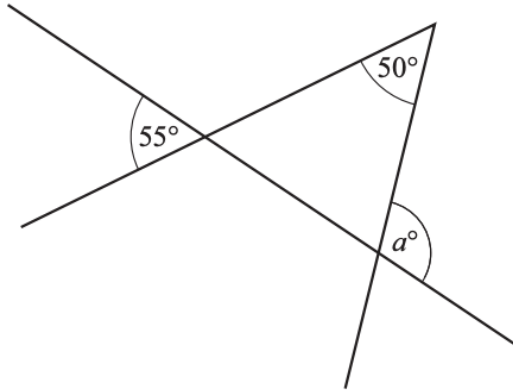
NOT TO SCALE

Use the information in the diagram to find the value of *a*.

50 + 55	1	
105	1	

13 Solve the inequality $6(2 - 3x) \leq 4(1 - 2x)$

$12 - 18x \leq 4 - 8x$	1	**M2** that leads to
$-18x + 8x \leq 4 - 12$		$x \leq 4/5$ or $x \geq -4/5$
$-10x \leq -8$	1	
$x \geq 4/5$ [or 0.8]	1	

14 In 2007, a tourist changed 5000 Chinese yuan into pounds (£) when the exchange rate was £1 = 14.925 Chinese yuan.

Calculate the amount he received, **giving your answer correct to 2 decimal places.**
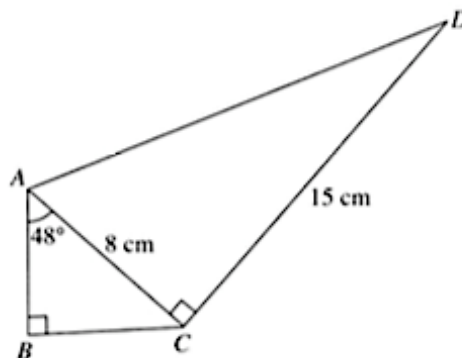
$5000 \div 14.925$	1	
335.01	1	**A0** for 335 or 33.00

15 The first five terms of a sequence are shown below.

14   10   6   2   -2

Find the *n*th term of this sequence.

|	$-4n + 18$	2	**B1** for $-4n$ seen

16 In the diagram, $\angle ABC$ and $\angle ACD$ are both right angles. $AC = 8$ cm and $CD = 15$ cm.

(a) Calculate the length of *AD*.
(b) Find the perimeter of quadrilateral *ABCD*.

(a)	$AD = 17$	1	
(b)	cos 48 = AB/8 $AB = 8 \cos 48$ $[AB = 5.3530]$	1	
	Sin 48 = BC/8 $BC = 8 \sin 48$ $[BC = 43.298]$	1	
	Perimeter = $AB + BC + CD + DA$ Perimeter = 43.3	1	cao

17 The cumulative frequency diagram shows information about the time, m minutes, taken by 120 students to complete some homework.
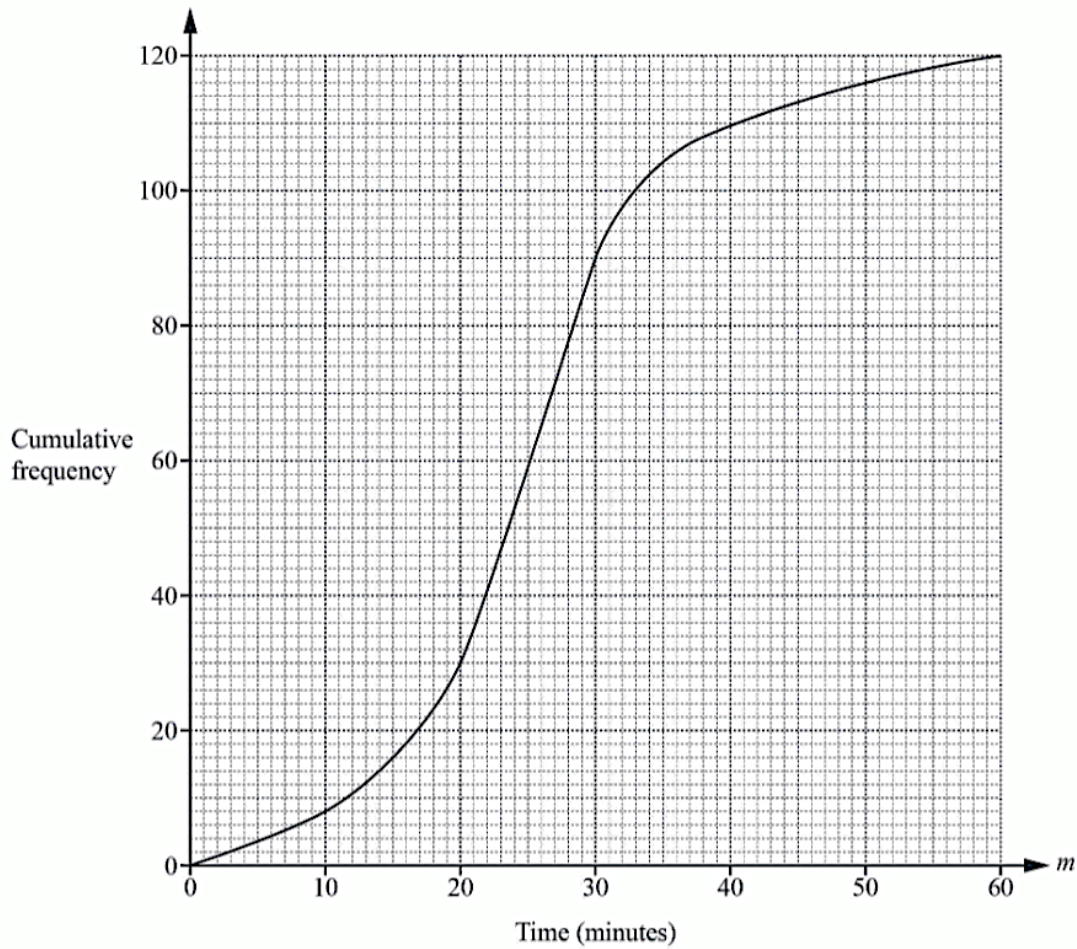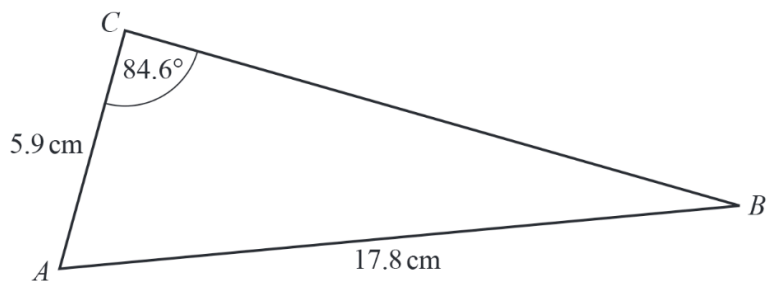

Use the cumulative frequency diagram to find an estimate of

(a) the median,
(b) the interquartile range,
(c) 90% percentile
(d) the number of students who took more than 50 minutes to complete the homework.

(a)	25	1	
(b)	10	2	**B1** for Q3 = 30 or Q1 = 20
(c)	38	1	
(d)	4	2	**B1** for 116

18 Find the area of triangle ABC.

NOT TO SCALE

$\sin B = 5.9 \times \frac{5.9 \sin 84.6}{17.8}$ $\angle B = 19.3°$	**1**	**SC1** for Area $= \frac{1}{2} \times 5.9 \times 17.8 \times \sin 84.6$	
$\angle A = 76.1°$	**1**		
Area $= \frac{1}{2} \times 5.9 \times 17.8 \times \sin 76.1$	**1**		
Area $= 51.0$ cm^2 [3 sf]	**1**		

19 The two flags are mathematically similar.
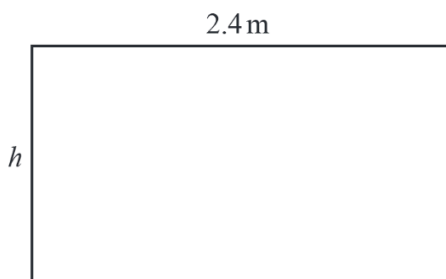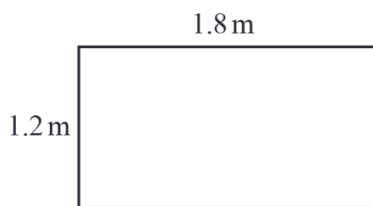
NOT TO SCALE

Calculate the height, h, of the second flag.

$\dfrac{1.2}{1.8} = \dfrac{h}{2.4}$	**1**
$h = 1.6$	**1**

9

20   Write the following in order, smallest first.

$$\sqrt{0.1} \qquad \frac{43}{210} \qquad 2\frac{1}{2}\% \qquad 0.2$$

	$2\frac{1}{2}\%, 0.2, \frac{43}{210}\ \sqrt{0.1}$	**2**	**M1** for 2 values correct Or **B1** for 3 items in correct order

21   Three people pick strawberries.
The strawberries are sold in boxes.

On Monday, the receive $390 for their boxes of strawberries.
They share this money in the ratio of Alison : Bob : Jenny = 7 : 3 : 2.

Work out how much money they each receive.

	Alison = $227.50	**1**	**SC1**
	Bob = $97.50	**1**	**32.50** seen
	Jenny = $65	**1**	

22   The probability that Tommy has his calculator for his mathematics lesson is 0.4.
There are 120 mathematics lessons in one year.

Work out an estimate of the number of mathematics lessons in one year that Tommy has his calculator.

	48	**1**	

- END OF EXAMINATION -