FORM 3 MATH MARKING SCHEME

PAPER 1 121/1

Q1	$\frac{1.33 \times 0.51}{0.19 \times 0.0017} \times \frac{1000000}{1000000}$	M1	
	$= \frac{\cancel{133} \times \cancel{51} \times 100}{\cancel{19} \times \cancel{17}} = 2100$	M1 A1	
2.	Ext : Int 1 : 3 $1\ ext = \frac{1}{4} \times 180 = 45°$ no. of sides $= \frac{360}{45} = 8$ sides Name – octagon	M1 A1 B1	
Q3	$\left(\frac{-K}{2}\right)^2 = 2 \times 18$ $K^2 = 36 \times 4$ $= 144$ $K = \pm 12$	M1 A1	
	$2x^2 - 12x + 18 = 0$ $2x^2 - 4x - 9x + 18 = 0$	M1	correct factors
	$2x(x-2) - 9(x-2) = 0$ $(x-2)(2x-9) = 0$ $x = 2$ $x = 4\frac{1}{2}$	A1	

DOWNLOAD MORE RESOURCES LIKE THIS ON **ECOLEBOOKS.COM**

Ecolebooks.com

4.	No | Log 6.225 | 0.7962 0.0004341 | $\bar{4}.6376^{+}$ $\bar{3}.4338$ 2 $\frac{\bar{4}+1.4338}{2}$ $\bar{2}.7169$ | $\bar{2}.7169$ 56.7 | 1.7536 0.031 | $\bar{2}.4914^{+}$ 0.2450 x 3 0.7350 | 0.7350 $\bar{3}.9819$ $10^{-3} \times 9.592 = 0.009592$	M1 M1 M1 A1	All logs ✓ numerator denominator
5	Lcm of 5, 4, 12 = 60 In 60 mins Kanja — 12 scripts Kanene — 15 scripts Nyaga — 5 scripts All — 32 scripts $60/7$ — $32/160$ = 300 mins = 5 hrs	M1 M1 A1	
6	(a) $\frac{1\text{km}}{5/60} = 1 \times \frac{60}{5} = 12$ km/hr. (b) $\frac{1000\text{M}}{5 \times 60} = 3\frac{1}{3}$ M/s	B1 B1	accept 3.333m/s reject 10

Ecolebooks.com

10. $\frac{1}{3}x + \frac{4}{3} - x + 2 = 2$ — M1

$-\frac{2}{3}x = -\frac{4}{3}$

$x = -\frac{4}{3} \times -\frac{3}{2} = 2$ — A1 — 2

11. (a)

Upper limits	Lower limits
5.5	4.5
12.5	11.5
13.5	12.5

B1

(b) Actual area $= \frac{1}{2} \times 5 \times 12 = 30 cm^2$

Max area $= \frac{1}{2} \times 5.5 \times 12.5 = 34.375$

Min area $= \frac{1}{2} \times 4.5 \times 11.5 = 25.875$ — M1

% error $= \frac{\frac{34.375 - 25.875}{2}}{30} \times 100$ — M1

$= 14.17\%$. — A1 — 4

12. $x = b \quad x = -\frac{1}{b}$

$(x - b)(x + \frac{1}{b}) = 0$ — M1

$x^2 + \frac{x}{b} - bx - 1 = 0$ — M1

$x^2 + (\frac{1}{b} - b)x - 1 = 0$ — A1 — 3

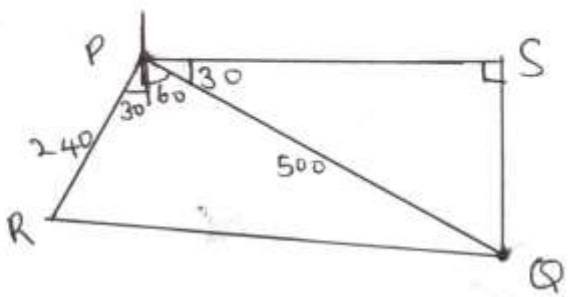
12. M $(2+4, 3+-5)$

Ecolebooks.com

14	Grad of L = 3 Grad of H = $-\frac{1}{3}$ Co-ord of intersection $(0,-4)$ $\frac{y--4}{x} = -\frac{1}{3}$ $\quad 3(y+4) = -x$ $3y + 12 = -x$ $3y = -x - 12$	B1 M1 A1
15	Length of Arc PQ $= \frac{\frac{5}{12}\pi}{2\pi} \times 2\pi \times 10$ $= \frac{25\pi}{2}$. $\frac{25}{2}\pi = 2\pi r \therefore r = \frac{25\pi}{2} \times \frac{1}{2\pi}$ $= \frac{25}{4} = 6.25\text{cm}$	M1 A1 M1 A1
16	$3^{2a+3} = 3^7$ $2a + 3 = 7$	M1 M1

Ecolebooks.com

7 (a)



B1 ✓ estimate of Ls

B1 ✓ diagram.

(b) $QR = \sqrt{500^2 + 240^2}$

M1

$= 554.7 \text{ km}$

A1

(c) $\sin 30 = \frac{QS}{}$

M1

Ecolebooks.com

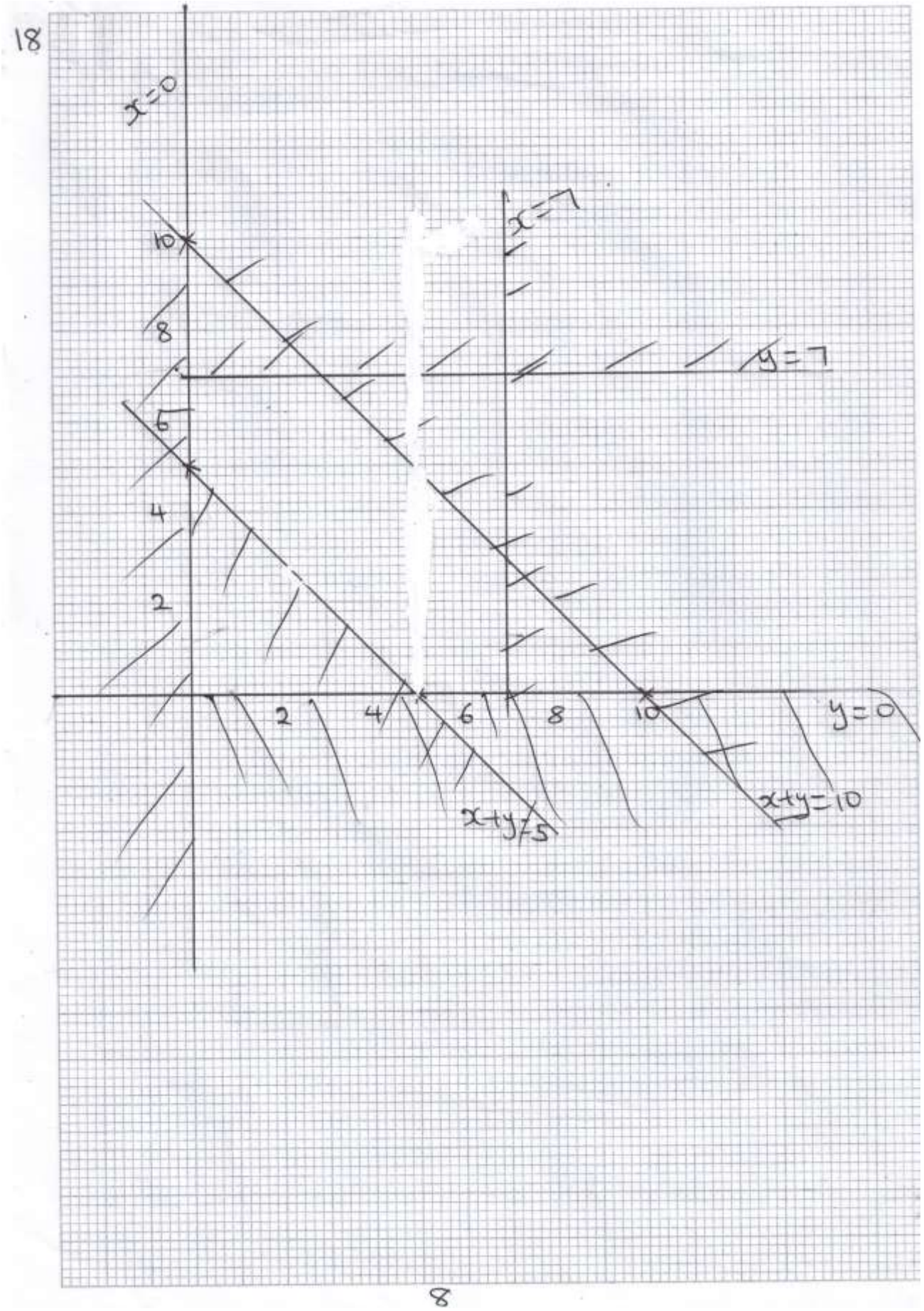
18	(a)	$x+y \geq 5$	x | 0 | 5 y | 5 | 0	B1	for each correctly drawn and shaded line -B0 for any broken line
		$x+y \leq 10$	x | 0 | 10 y | 10 | 0		
	(b)	Any one		B1	

Ecolebooks.com

DOWNLOAD MORE RESOURCES LIKE THIS ON ECOLEBOOKS.COM

Ecolebooks.com

18



Ecolebooks.com

19 (a) $\angle ADE = 50°$ B1
($\angle AED = 90° - \angle$s in a semi-circle) B1

(b) Reflex $EOD = 360 - (40 \times 2)$
$= 360 - 80 = 280°$ B1
($\angle$ at centre $= 2\angle$ on circumference) B1

(c) $\angle EBD = 40°$ B1
($\angle$s in same segment) B1
(or $\angle$s subtended by same chord/arc)

(d) $\angle EAB = 90°$ B1
($\angle$s in a semi-circle) B1

(e) $\angle DAB = 180 - 118 = 62°$ B1
(opp. $\angle$s in a cyclic quad are supp). B1

20 (a) 8

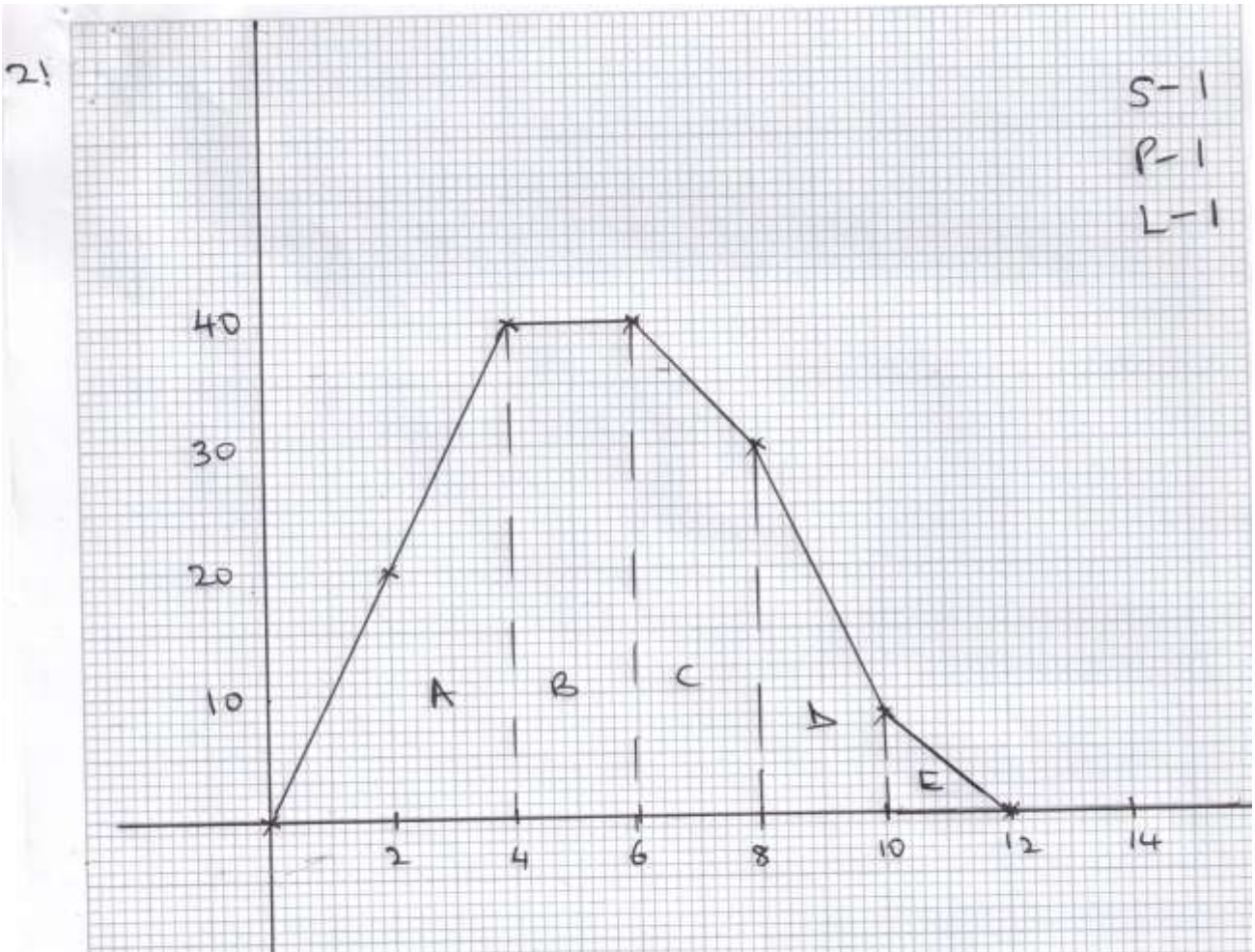
class	f	x	xf	C.f
20 – 29	2	24.5	49	2
30 – 39	8	34.5	276	10
40 – 49	14	44.5	623	24
50 – 59	18	54.5	981	42
60 – 69	10	64.5	645	52
70 – 79	6	74.5	447	58
80 – 89	2	84.5	169	60
	60		3190	

B1 ✓ classes
B1 ✓ f
B1 ✓ x
B1 ✓ xf
B1 ✓ cf

Ecolebooks.com

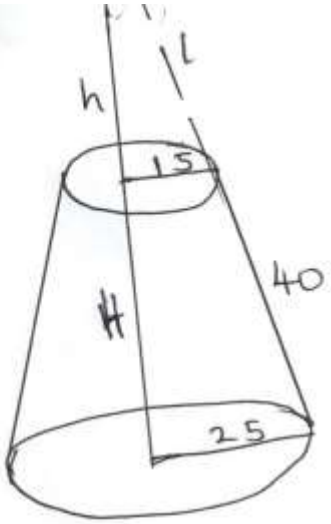
20	(b) 50 − 59	B1	
	(c) $\bar{x} = \frac{3190}{60} = 53.17$	M1 A1	If arithmetic error in x or xf, award B0 but M1 A0.
	(d) $M = 49.5 + \left(\frac{30-24}{18}\right) \times 10$ $= 49.5 + \frac{10}{3} = 52.83$	M1 A1 10	
21	(b) $acc = \frac{40-0}{4-0} = 10\ m/s$	M1A1 S1 P1 L1	
	(c) Areas of A $= \frac{1}{2} \times 4 \times 40 = 80$ B $= 40 \times 2 = 80$ C $= \frac{1}{2}(40+30)2 = 70$ D $= \frac{1}{2}(30+8)2 = 38$ E $= \frac{1}{2} \times 2 \times 8 = 8$	M1M1	

Ecolebooks.com



Ecolebooks.com

22 (a)



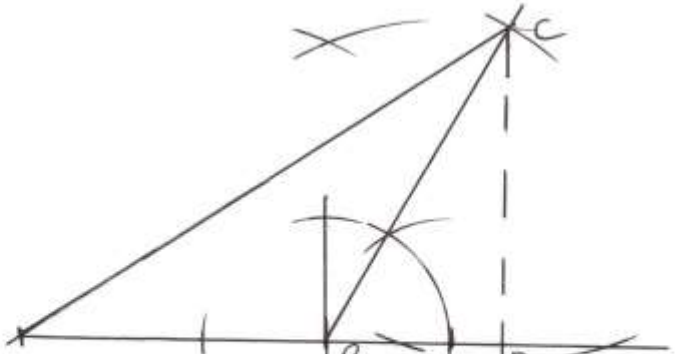
$\frac{15}{25} = \frac{l}{l+40}$

$15l + 600 = 25l$

M1

Ecolebooks.com

23 (a)



B1	90°
B1	30°
B1	Correct diagram
B1	Dropping CP

Ecolebooks.com

DOWNLOAD MORE RESOURCES LIKE THIS ON ECOLEBOOKS.COM

Ecolebooks.com

24 (b) Time minibus reached B

$= \frac{360}{90} = 4\text{hrs}$ M1

$8.15 + 4 = 12.15\text{p.m.}$

Time motorist took $= 12.15 - 10.30 = 1.45$ M1

1hr 45mins

$d = 100 \times 1\frac{45}{60}$ M1

$= 100 \times 1\frac{3}{4}$

$= 100 \times \frac{7}{4} = 175\text{km}$. A1

Ecolebooks.com

DOWNLOAD MORE RESOURCES LIKE THIS ON ECOLEBOOKS.COM

Ecolebooks.com

DOWNLOAD MORE RESOURCES LIKE THIS ON ECOLEBOOKS.COM

Ecolebooks.com

DOWNLOAD MORE RESOURCES LIKE THIS ON ECOLEBOOKS.COM

Ecolebooks.com

DOWNLOAD MORE RESOURCES LIKE THIS ON ECOLEBOOKS.COM