SHARP

June Exam Memorandum

Grade 8 Mathematics

Marks: 150

Time: 2 hours

Question 1 [16]

1.1. 25; 78; 23; -7; $\sqrt{-2}$; $\frac{0}{5}$; $\frac{8}{0}$; 36; -64; 51;

1.1.1. 25, 78, 23, -7, $\frac{0}{5}$, 36, -64, 51 (2) minus ½ for every two values missing from the list

1.1.2. $\sqrt{-2}$, $\frac{8}{0}$ (2) 1 mark each

1.1.3. 25, 36 (1) ½ mark each

1.1.4. -64 (1)

1.1.5. 23, 51 (2) 1 mark each

1.2. 1.2.1. 84: 1, 2, 3, 4, 6, 7, 12, 14, 21, 28, 42, 84 (2)

minus ½ for every 2 values missing from the list

1.2.2. 54: 1, 2, 3, 6, 9, 18, 27, 54 (2)

Minus ½ for every 2 values missing from the list

1.3. 1.3.1.

98	**2**
49	**7**
7	7
1	

70	**2**
35	**7**
5	5
1	

∴ Highest common factor: 2 x 7 = 14 √

∴ Lowest Common Multiple: 2 x 7 x 7 x 5 = 490 √ (2)

1.3.2.

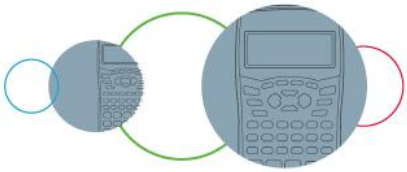
72	**2**
36	**2**
18	**2**
9	**3**
3	3
1	

120	**2**
60	**2**
30	**2**
15	**3**
5	5
1	

∴ HCF = 2 x 2 x 2 x 3 = 24

∴ LCM = 2 x 2 x 2 x 3 x 3 x 5

= 360



Question 2 [13]

2.1. $\sqrt{0.36}$ (2)

$= \sqrt{\frac{36}{100}}$ √

$= \frac{6}{10}$

$= 0.6$ √

2.2. $(-8)^2 \div -4$ (2)

$= 64 \div -4$ √

$= -16$ √

2.3. $(-4) + (-4) - (-8)$ (2)

$= -4 - 4 + 8$ √

$= 0$ √

2.4. $5 \times \frac{-42}{6} + (-12)$ (3)

$= 5 \times -7 - 12$ √

$= -35 - 12$ √

$= -47$ √

2.5. $\sqrt[3]{-3\frac{3}{8}}$ (2)

$= \sqrt[3]{\frac{-27}{8}}$ √

$= -\frac{3}{2}\ or\ -1.5$ √

2.6. $2 - 16 + 3 \times -2$ (2)

$= -14 - 6$ √

$= -20$ √

Question 3 [18]

3.1. 3.1.1. 3 x 3 x 3 x 2 x 2 x 2x 2 = $3^3 \times 2^4$ √√ (2)

3.1.2. a x a x b x b x b x b = a^2 x b^4 √√ (2)

3.2. 3.2.1. 464 000 = 4,64 x 10^5 √ (1)

3.2.2. 0.332 = 3,32 x 10^{-1} (1)

3.3. 3.3.1. 4.92 x 10^3 = 4 920 √ (1)

3.3.2. 7.22 x 10^8 = 722 000 000 √ (1)

3.4 3.4.1. $\frac{(a^4b)^0}{ab^8} \times \frac{cb^2}{a^5c^2}$ (3)

$= \frac{1}{ab^8} \times \frac{b^2}{a^5c}$ √√

$= \frac{b^2}{a^6b^8c}$

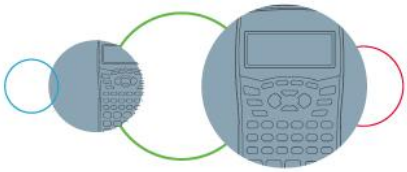
$= \frac{1}{a^6b^6c}$ √

3.4.2. $\frac{(x^2y)^{-1}}{(xy^2z)^3} \div \frac{2x^3y^{-7}}{4x^4y^8} \times \frac{6xy}{z^3}$ (4)

$= \frac{x^{-2}y^{-1}}{x^3y^6z^3} \times \frac{4x^4y^8}{2x^3y^{-7}} \times \frac{6xy}{z^3}$ √√

$= \frac{24x^3y^8}{2x^6y^{-1}z^6}$ √

$= \frac{12y^9}{x^3z^6}$ √



3.5. $3^x + 1 = 10$

(3)

$3^x = 9$ √

$3^x = 3^2$ √

$x = 2$ √

Question 4 [9]

4.1. 20, 26, 32, 38…

(3)

i) 44, 50, 56 √

ii) Add 6 to the previous term √

iii) 20 + (6)(20) – 6 = 134 √

4.2. 3, 6, 12, 24…

(3)

i) 48, 96, 192 √

ii) multiply the previous term by 2 √

iii) 3 x 2(20 times) ∴ 3 x 2^{20} = 3 145 728 √

4.3. 8, 10, 13, 17, 23… (3)

i) 8, +2 10, +3 13, +4 17, + 5 23 +**6 29 + 7 36 + 8 44** √

ii) add an extra one to each previous number that has been added. √

iii) 44 +9 53 +10 63 + 11 74 +12 86 + 13 99 + 14 113 + 15 128
+ 16 144 + 17 161 + 18 179 + 19 198 + 20 **218** √

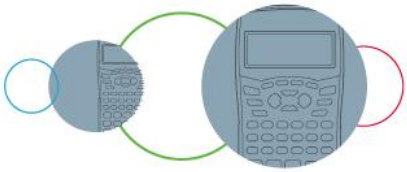
Question 5 [6]

5.1.

Number of Hours Worked	1	2	3	7	10	**14**	**20**
Amount Earned	35	70	**105**	**245**	**350**	490	700

1 mark each (5)

5.2. M = 35x n (1)



Question 6 [25]

6.1. $7x^6 - 8x^4 + 2x^3 - 3x + 10$

6.1.1. 6th degree √ (1)

6.1.2. -8 √ (minus sign must be there to get the mark) (1)

6.1.3. 5 terms √ (1)

6.1.4. 10 √ (1)

6.2. 6.2.1. $3x(4x + y)$ (2)

$= 12x^2 + 3xy$ √√

6.2.2. $-y(8y - 2)$ (2)

$= -8y^2 + 2y$ √√

6.2.3. $-4xy(4x^2 + 7y - 8xy)$ (3)

$= -16x^3y - 28xy^2 + 32x^2y^2$ √√√

6.2.4. $12a(4a + b) - 6b(7a - 3)$ (4)

$= 48a^2 + 12ab - 42ab + 18b$ √√

$= 48a^2 - 30ab + 18b$ √√

6.2.5. $(3x^3 - 27x^2 + 6xy) \div 3x$ (3)

$= x^2 - 9x + 2y$ √√√

6.2.6. $\frac{1}{2}c(4c^2 + 16c - 10) - 8c^2$ (3)

$= 2c^3 + 8c^2 - 5c - 8c^2$ √√

$= 2c^3 - 5c$ √

6.3. 6.3.1. 8a + 8b +7a + 11b √√

= 15a +19b √ (3)

6.3.2. 12 x e √ (1)

Question 7 [13]

7.1. 7.1.1. $3(x - 4) = 6$ (3)

$3x - 12 = 6$ √

$3x = 18$ √

$x = 6$ √

7.1.2. $\frac{x}{9} - 5 = -1$ (3)

$\frac{x}{9} = 4$ √

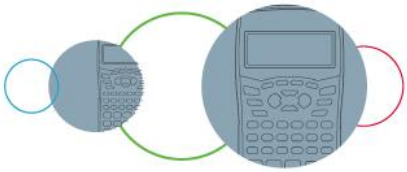
$x = 36$ √√

7.1.3. $\frac{2x}{3} + 20 = 10$ (4)

$\frac{2x}{3} = -10$ √

$2x = -30$ √

$x = -15$ √√



7.2.

	Now	In 10 years-time
Mom	$3x$	$2(x+10)$
Sindiswa	x	$x+10$

$\therefore 3x + 10 = 2(x + 10)$ √√

$\therefore 3x + 10 = 2x + 20$

$\therefore x = 10$ √ (3)

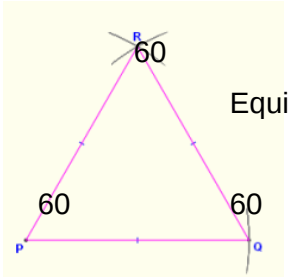
Question 8 [16]

8.1. All sides are equal to 4.5cm (± 3mm). √√

All three angles are labelled 60° √√

Angles measure 60° √

Triangle is labelled √ (6)



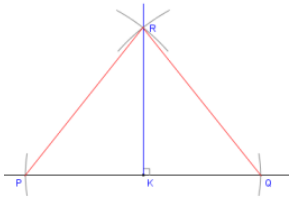
Equilateral Triangle

8.2. 1st line with point marked √

4 arcs points marked √

Straight line from point to crossing arcs √

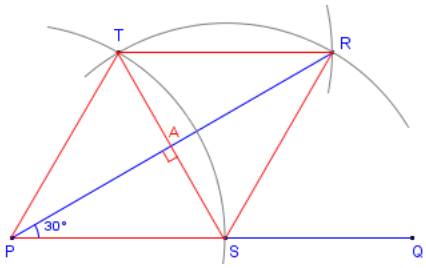
Angle measures 90° √ (4)



8.3. 3 arcs √√

Line from end point of line to third arc √

Angle measures 30° and is labelled 30° √ (4)



Question 9 [14]

9.1. 9.1.1. All parallelograms are squares.

False – all squares are parallelograms √√

9.1.2. All squares are rhombi. **True** √

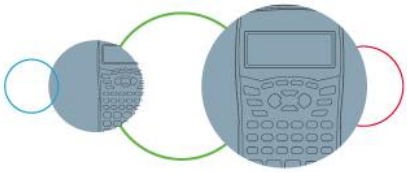
9.1.3. A scalene triangle has two sides that are equal.

False – a scalene triangle has no equal sides. √√

9.1.4. Two intersecting lines with equal angles opposite each other are called corresponding angles.**False – two intersecting lines with equal angles opposite each other are called vertically opposite angles.** √√

9.1.5. All parallelograms are trapeziums. (8)

True. √



9.2. 9.2.1 Neither – the shapes are not the same √√ (2)

9.2.2. Similar √ All three angles are equal √ (2)

9.2.3. Congruent √ SAS √ (2)

Question 10 [20]

10.1. 10.1.1. $G\hat{C}E = 90°$ EC ⊥ GB

$G\hat{C}E + D\hat{E}C = 180°$ Corresponding ∠s equal DE ∥ GB √

$\therefore D\hat{E}C = 90°$

∴ EC ⊥ DE √ (2)

10.1.2. In ΔDEH and ΔBGH

1. $E\hat{D}H = H\hat{B}G$ Alt angles √
2. $D\hat{H}E = G\hat{H}B$ Angles Vert. Opp. √
3. $D\hat{E}H = H\hat{G}B$ Alt Angles √

∴ ΔDHE ||| ΔBHG (3)

10.1.3. In ΔDEF and ΔBCF. (3)

1. $D\hat{E}F = F\hat{C}B$ Both equal to 90° √
2. EF = FC Given √
3. $E\hat{F}D = C\hat{F}B$ Vert. opp. √

∴ ΔDEF ≡ ΔBCF (A,S,A)

10.2 10.2.1. In ΔACD and ΔCEF

1. $\hat{C}$ is common √
2. $A\hat{D}C = E\hat{F}C$ Corr. Angles √
3. $D\hat{A}C = F\hat{E}C$ Corr. Angles √

∴ ΔACD ||| ΔCEF (All three angles equal) √ (4)

10.2.2. Any two of the following: (2)

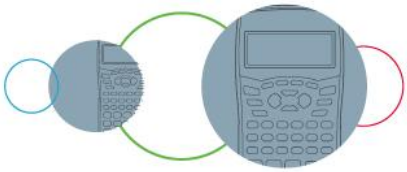
$G\hat{A}B = A\hat{D}F$ Corr. Angles √

$A\hat{D}F = B\hat{F}C = G\hat{A}B$ Corr. Angles √

$G\hat{A}B = I\hat{A}D$ Vert. Opp. √

$I\hat{A}D = A\hat{B}F = G\hat{A}B$ Corr. Angles √

$A\hat{D}F = D\hat{F}H = G\hat{A}B$ Alt angles √



10.2.3.	10.2.3.1.	$E\hat{C}F = B\hat{A}E$	Alt angles	√	
		$B\hat{A}E = J\hat{A}I = 40°$	Vert. Opp.	√	(2)
	10.2.3.2.	$I\hat{A}D = A\hat{D}F = 65°$	Alt angles	√√	(2)
	10.2.3.3.	$\therefore J\hat{A}D = I\hat{A}D + J\hat{A}I$		√	
		$\therefore J\hat{A}D = 65° + 40 = 105°$		√	(2)

Grand Total [150]