



GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

**GAUTENG DEPARTMENT OF EDUCATION
PROVINCIAL EXAMINATION
2015
GRADE 9**

MATHEMATICS

MEMORANDUM

8 pages

**GAUTENG DEPARTMENT OF EDUCATION
PROVINCIAL EXAMINATION**

MATHEMATICS

SECTION A**QUESTION 1**

1.1	B	✓
1.2	D	✓
1.3	D	✓
1.4	C	✓
1.5	D	✓
1.6	D	✓
1.7	B	✓
1.8	C	✓
1.9	B	✓
1.10	C	✓

[10]

SECTION B**QUESTION 2**

2.1 $b = 5$ ✓ (1)

2.2 R800 ✓ (1)

2.3 $3\sqrt{2}$ ✓ (1)

2.4 $(2x)^3 \times -2x^2$
 $8x^3 \times -2x^2$ ✓
 $-16x^5$ ✓ (2)

2.5 $P = A(1+i)^n$ ✓
 $= 2000(1+0,06)^5$ ✓
 $= R2676,45$ ✓ (3)

$$2.6 \quad I = \frac{Pnr}{100}$$

$$675 = \frac{2500 \times n \times 9}{100} \checkmark$$

$$675 = 225n \checkmark$$

$$n = \frac{675}{225}$$

$$n = 3 \checkmark$$

It took her 3 years.

(3)

$$2.7 \quad 5 + 6 + 7 = 18 \checkmark$$

$$\begin{aligned} \text{The size} &= \frac{7}{18} \times 180^\circ \checkmark \\ &= 70^\circ \checkmark \end{aligned}$$

(3)

[14]

QUESTION 3

3.1 3.1.1

Figure	1	2	3	4
Number of Triangles	4	8	12✓	16✓

(2)

3.1.2 Add 4 to each term to get the next term. ✓

(1)

$$3.1.3 \quad T_n = 4 = 4(1)$$

$$T_n = 8 = 4(2)$$

$$T_n = 12 = 4(3)$$

$$T_n = 4n \checkmark$$

(1)

$$3.2 \quad 3.2.1 \quad 3p^2q + 15pq^2 - 12pq$$

$$= 3pq \checkmark (p + 5q - 4) \checkmark$$

(2)

$$3.2.2 \quad 3x(x - 3) + 2(3 - x)$$

$$= 3x(x - 3) - 2(x - 3) \checkmark \checkmark$$

$$= (x - 3)(3x - 2) \checkmark$$

(3)

$$3.2.3 \quad 75x^3 - 12x$$

$$= 3x \checkmark (25x^2 - 4) \checkmark$$

$$= 3x(5x - 2)(5x + 2) \checkmark$$

(3)

$$3.3 \quad = 2(3)^2 + 5(3) - 12 \checkmark$$

$$= 18 + 15 - 12 \checkmark$$

$$= 21 \checkmark$$

(3)

[15]

QUESTION 4

4.1 Simplify.

$$\begin{aligned}
 4.1.1 \quad & \frac{2x^3y^3}{2x^4} \times \frac{4xy^3}{6y} \times \frac{3x^2}{xy^3} \quad \text{OR} \quad \frac{6x^2y^5}{3xy^3} \checkmark\checkmark\checkmark \quad \text{OR} \quad \frac{24x^6y^6}{12x^5y^4} \checkmark\checkmark\checkmark \\
 & = \frac{y^3}{x} \times \frac{2xy^2}{3} \times \frac{3x}{y^3} \checkmark\checkmark\checkmark \\
 & = 2xy^2 \checkmark
 \end{aligned}
 \tag{4}$$

$$\begin{aligned}
 4.1.2 \quad & \sqrt[3]{\frac{54x^6}{2x^3}} - \sqrt{\frac{8x^2y^3}{2y}} \\
 & = \sqrt[3]{27x^3} \checkmark - \sqrt{4x^2y^2} \checkmark \\
 & = 3x - 2xy \checkmark
 \end{aligned}
 \tag{3}$$

$$\begin{aligned}
 4.1.3 \quad & \frac{y+4}{3} - \frac{3y+2}{4} \\
 & = \frac{4(y+4) - 3(3y+2)}{12} \checkmark\checkmark \\
 & = \frac{4y+16-9y-6}{12} \checkmark \\
 & = \frac{-5y+10}{12} \checkmark
 \end{aligned}
 \tag{4}$$

$$\begin{aligned}
 4.1.4 \quad & \frac{(x+3)(x-2)}{4-2x} \\
 & = \frac{(x+3)(x-2)}{-2(x-2)} \checkmark\checkmark \\
 & = -\frac{(x+3)}{2} \checkmark
 \end{aligned}
 \tag{3}$$

$$\begin{aligned}
 4.1.5 \quad & -3(x+2) + 4x - 3 + 2(2x-1) \\
 & = -3x - 6 \checkmark + 4x - 3 + 4x - 2 \checkmark \\
 & = 5x - 11 \checkmark
 \end{aligned}
 \tag{3}$$

4.2.1 $3(x+1) = 2x+3$

$$3x+3 = 2x+3 \checkmark$$

$$3x-2x = 3-3 \checkmark$$

$$x = 0 \checkmark$$

(3)

4.2.2 $\frac{2x+1}{3} = 5 - \frac{1}{2}x$

$$\frac{2x+1}{3} \times 6 = 5 \times 6 - \frac{1}{2}x \times 6 \checkmark$$

$$2(2x+1) = 30 - 3x \checkmark$$

$$4x+2 = 30 - 3x \checkmark$$

$$7x = 28 \checkmark$$

$$x = 4 \checkmark$$

(5)

4.2.3 $2^{x+1} = 16$

$$2^{x+1} = 2^4 \checkmark$$

$$x+1 = 4 \checkmark$$

$$x = 3 \checkmark$$

(3)

4.3 $5x = 48 - x \checkmark$

$$6x = 48 \checkmark$$

$$x = 8 \checkmark \text{ The number is 8.}$$

(3)

[31]**QUESTION 5**

5.1 5.1.1 $4x + 2(0) = -3 \checkmark$

$$4x = -3$$

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

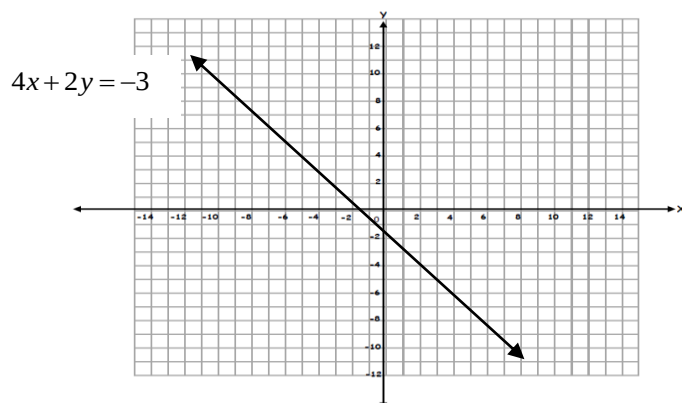
$$\left(-\frac{3}{4}; 0\right) \checkmark \quad \text{OR} \quad (-0,75; 0)$$

(2)

5.1.2 $\left(0; -\frac{3}{2}\right) \checkmark \quad \text{OR} \quad (0; -1,5)$

(1)

5.1.3



(2)

$$5.2 \quad 5.2.1 \quad m = \frac{\Delta y}{\Delta x} = \frac{2}{2} \checkmark \quad \text{OR} \quad m = \frac{2-0}{0-(-2)} = 1 \quad (2)$$

$$= 1 \checkmark$$

$$5.2.2 \quad y = x + 2 \checkmark \checkmark \quad (2)$$

[9]

QUESTION 6

$$6.1 \quad 6.1.1 \quad \begin{array}{ll} x = 36^\circ \checkmark & [\text{angles opposite equal sides}] \checkmark (1/2) \\ y = 90^\circ - 36^\circ \checkmark & [\text{sum of angles of a triangle}] \checkmark (1/2) \\ y = 54^\circ \checkmark & \end{array} \quad (4)$$

$$6.1.2 \quad \text{In } \triangle CAB \quad \begin{array}{ll} x = \hat{B} \checkmark (1/2) & [\text{angles opposite equal sides}] \checkmark (1/2) \\ 2x = 180^\circ - 80^\circ \checkmark (1/2) & [\text{sum of angles of a triangle}] \checkmark (1/2) \\ x = 50^\circ \checkmark (1/2) & \\ x = y + 25^\circ \checkmark (1/2) & [\text{exterior angle of a triangle}] \checkmark (1/2) \\ y = 50 - 25^\circ \checkmark (1/2) & \\ y = 25^\circ \checkmark (1/2) & \end{array} \quad (4)$$

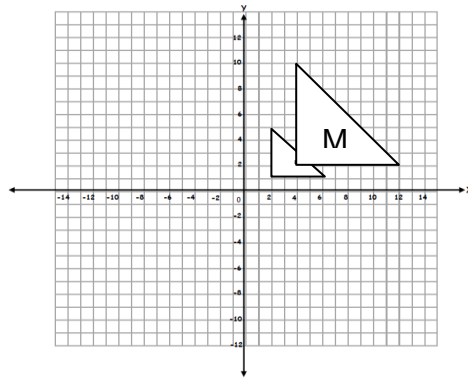
$$6.2 \quad \begin{array}{ll} \hat{E} = \hat{G} \checkmark (1/2) & [\text{alternate angles; } EF \parallel HG] \checkmark (1/2) \\ \hat{F} = \hat{H} \checkmark (1/2) & [\text{alternate angles; } EF \parallel HG] \checkmark (1/2) \end{array}$$

$$\left(\begin{array}{l} \text{OR} \\ \hat{O}_1 = \hat{O}_2 \text{ vertical opposite angles} \\ \therefore \triangle EFO \equiv \triangle GHO \checkmark (1/2) \quad [\text{AAS}] \checkmark (1/2) \end{array} \right)$$

$$FO = OH \checkmark (1/2) \quad [\text{given}] \checkmark (1/2) \quad (4)$$

$$6.3 \quad \begin{array}{l} \frac{x}{17} = \frac{69}{23} \checkmark \\ x = 17 \times 3 = 51 \checkmark \checkmark \\ \frac{y}{75} = \frac{23}{69} \checkmark \\ 3y = 75 \\ y = 25 \checkmark \end{array} \quad (5)$$

6.4



✓✓✓ (1 mark for each vertex)

(3)

[20]

QUESTION 7

$$7.1.1 \quad \text{Area } \triangle DEF = \frac{1}{2} \times 8 \text{ cm} \times 6 \text{ cm} \checkmark$$

$$= 24 \text{ cm}^2 \checkmark$$

(2)

$$7.1.2 \quad V = \text{Area of base} \times \text{height}$$

$$= 24 \text{ cm}^2 \times 15 \text{ cm} \checkmark$$

$$= 360 \text{ cm}^3 \checkmark$$

(2)

$$7.2.1 \quad \text{Perimeter} = 5 \times 6 \text{ cm} = 30 \text{ cm} \checkmark$$

(1)

$$7.2.2 \quad OA^2 = OB^2 - AB^2$$

$$OA^2 = (5 \text{ cm})^2 - (3 \text{ cm})^2 \checkmark$$

$$OA^2 = 25 \text{ cm}^2 - 9 \text{ cm}^2$$

$$OA^2 = 16 \text{ cm}^2 \checkmark$$

$$OA = 4 \text{ cm} \checkmark$$

(3)

$$7.2.3 \quad A = 10 \text{ (Area of } \triangle AOB) \checkmark$$

$$= 10 \left(\frac{1}{2} \times 3 \text{ cm} \times 4 \text{ cm} \right) \checkmark$$

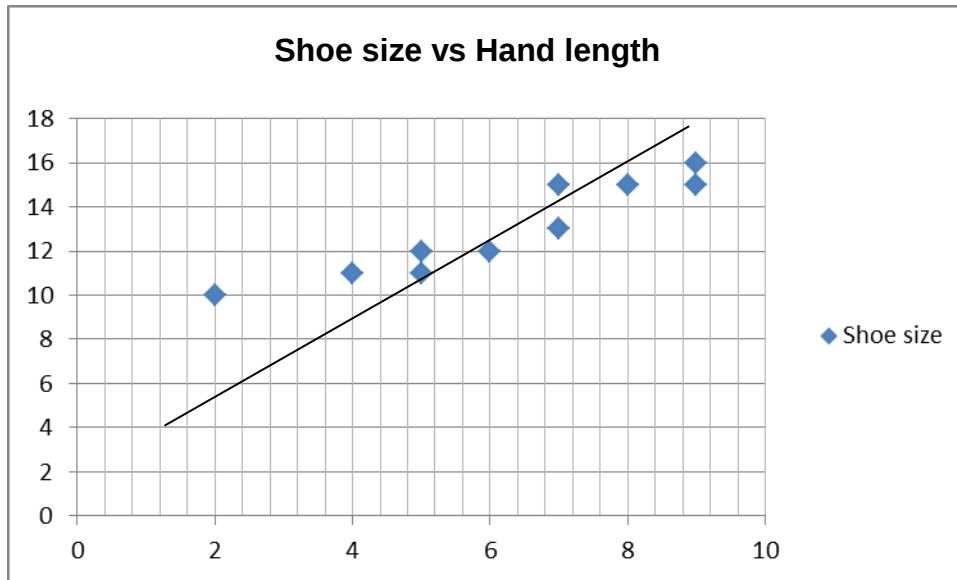
$$= 60 \text{ cm}^2 \checkmark$$

(3)

[11]

QUESTION 8

8.1



✓✓✓✓

(4)

8.2 For line of best fit see the graph. ✓

(1)

8.3 The length of the hand is in direct proportion with the shoe size. ✓

(1)

8.4 Mode = 15 ✓

(1)

8.5 Calculate the mean for the shoe size.

$$\text{Mean} = \frac{12 + 13 + 10 + 15 + 12 + 15 + 11 + 16 + 15 + 11}{10} \checkmark$$

$$= 13 \checkmark$$

(2)

8.6 Range = $9 - 2 = 7$ ✓

(1)

[10]**TOTAL: 120**