GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

GAUTENG DEPARTMENT OF EDUCATION

PROVINCIAL EXAMINATION

NOVEMBER 2016

GRADE 9

MATHEMATICS

MEMORANDUM

9 pages

GAUTENG DEPARTMENT OF EDUCATION

PROVINCIAL EXAMINATION

MATHEMATICS

SECTION A

QUESTION 1

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

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SECTION B

QUESTION 2

2.1 2.1.1 $P = A(1+i)^n$ ✓ (3)

$= 15000(1+0,08)^1$ ✓

$= R16200$ ✓

2.1.2 $P = A(1+i)^n$ ✓

$= 15000(1+0,08)^5$ ✓

$= R22039,92115 \approx R22039,92$ ✓ (3)

2.2 $\sqrt[3]{-64}+(-3)^2$

$=-4+9$ ✓

$=5$ ✓ (2)

2.3 $\frac{3}{4}:1\frac{1}{2}:\frac{1}{3}$

$\frac{3}{4}:\frac{3}{2}:\frac{1}{3}$ ✓

$9:18:4$ ✓ (2)

2.4 $\frac{16,5l}{100km}=\frac{xl}{1284km}$ ✓

$100x=21186$ ✓

$x=211,86$ ✓ (2)

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QUESTION 3

3.1 3.1.1 3 Balls ✓ (1)

3.1.2

Figure	1	4	5
Number of balls	5	14✓	17✓

(2)

3.1.3 Yes. ✓
Difference is 3
$T_n=3n+2$ ✓
$3(n-1)+5=3n-3+5=3n+2$ ✓ (3)

3.2 $(2x-1)^2=4x^2+1$

LHS $=(2x-1)(2x-1)$

$=4x^2-4x+1$✓

Not correct / $4x^2+1\neq 4x^2-4x+1$✓ (2)

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QUESTION 4

4.1 $-2(2x^2-3x+5)-(4x^2-3)$

$=-4x^2+6x-10-4x^2+3$ ✓✓

$=-8x^2+6x-7$ ✓ (3)

4.2 4.2.1 $-\frac{b^3}{12}(4b-\frac{2ab}{6}+12)$

$=-\frac{b^4}{3}$ ✓ $+\frac{ab^4}{36}$ ✓ $-b^3$ ✓ (3)

4.2.2 $\frac{4x^3-2x(3x^2)}{2x^3}$

$=\frac{4x^3-6x^3}{2x^3}$ ✓

$=\frac{-2x^3}{2x^3}$ ✓

$=-1$ ✓ (3)

4.3 $x(a+y)-(y+a)$

$=x(a+y)-(a+y)$ ✓

$=(a+y)(x-1)$ ✓ (2)

4.4 4.4.1 $2(x+2)-(x-3)=5$

$2x+4-x+3=5$ ✓✓

$x+7=5$ ✓

$x=-2$ ✓ (4)

4.4.2 $\frac{2x}{x+1}+\frac{2x}{1-x}=\frac{1}{x^2-1}$

$\frac{2x}{x+1}-\frac{2x}{x-1}$ ✓ $=\frac{1}{(x-1)(x+1)}$ ✓

$2x(x-1)-2x(x+1)=1$

$2x^2-2x$ ✓ $-2x^2-2x$ ✓ $=1$

$-4x=1$

$x=-\frac{1}{4}$ ✓ (5)

4.4.3 $10^x = 0{,}0001$

$10^x = 10^{-4}$ ✓

$x = -4$ ✓ (2)

4.5 Let the first number be $2x$, then the second is $2x+2$ and third $2x+4$

$\therefore 2x+2x+2+2x+4=78$ ✓

$6x+6=78$

$6x=78-6$

$\frac{6x}{6}=\frac{72}{6}$

$x=12$ ✓

$\therefore$ the numbers are 24 ✓, 26 ✓and 28 ✓ (5)

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QUESTION 5

5.1 $y=2x-1$ ✓✓ (2)

5.2 $m=\frac{y_2-y_1}{x_2-x_1}$ OR $m=\frac{\Delta y}{\Delta x}$ ✓ $=\frac{3}{2}$ ✓

$m=\frac{-3-0}{-2-0}$ ✓

$=\frac{3}{2}$ ✓ (2)

5.3 The equation $y-1=2(x-2)$ defines a straight line graph.

5.3.1 *y-intercept* $=-3$ (1)

5.3.2 $y-1=2(x-2)$

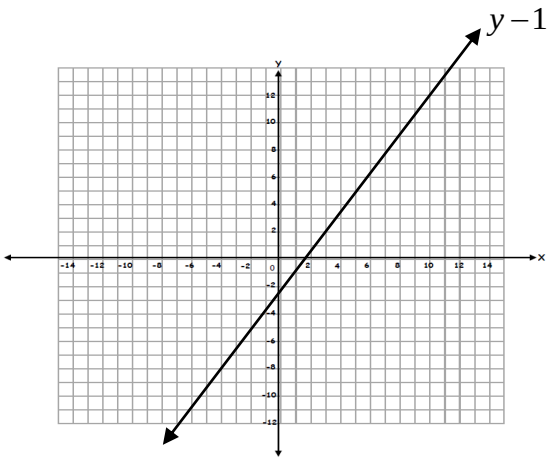
$0-1=2(x-2)$ ✓

$0-1=2x-4$

$3=2x$ ✓

$x=\frac{3}{2}$ ✓ (3)

5.3.3



✓✓ *(1 mark for each intercept)*

(2)

5.4 5.4.1 ***p***. ✓ Increasing graph **OR** when x increases, y also increases **OR** x and y are directly proportional ✓ (2)

5.4.2 $y=-x$ ✓ $+5$ ✓ (2)

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QUESTION 6

6.1 a = 55^0 ✓ [corresponding angles of parallel lines] ✓

b = 55^0 ✓ [opposite angles of a parallelogram] ✓ (4)

6.2 AB = BE [given] ✓

AB = DC ✓ [opposite sides of a parallelogram ✓]

$\therefore$ DC=BE ✓ [both = AB] ✓ (4)

6.3 6.3.1 In ΔDCB and ΔAED

$\hat{D}_1 = \hat{A}$ ✓ [alternate angles; DC // AE] ✓

$\hat{B} = \hat{D}_2$ ✓ [alternate angles; BC // DE] ✓

$\therefore \hat{C} = \hat{E}$ ✓ [interior angles of a triangle] ✓

$\therefore$ ΔDCB /// ΔAED [AAA] (6)

6.3.2 $\frac{AD}{DB} = \frac{ED}{CB}$ ✓

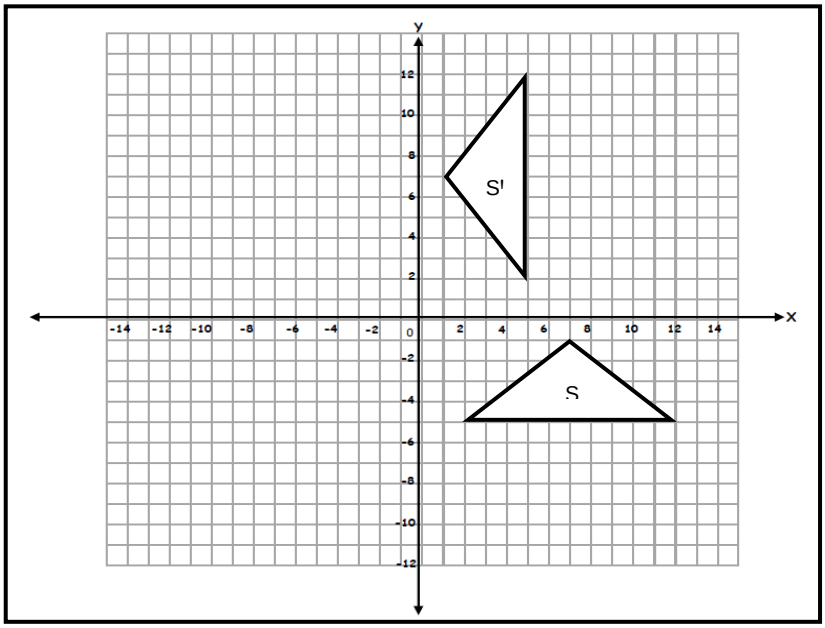
$\frac{AD}{5{,}2\text{ cm}} = \frac{7{,}5\text{ cm}}{3\text{ cm}}$ ✓

AD = 13 cm ✓

∴ AB = 13 cm – 5,2 cm

= 7,8 cm ✓ (4)

6.4



✓✓✓ (*1 mark for each vertex of the image*) (3)

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QUESTION 7

7.1 7.1.1 Find the length of BC.

$BC^2 = AB^2 + AC^2$

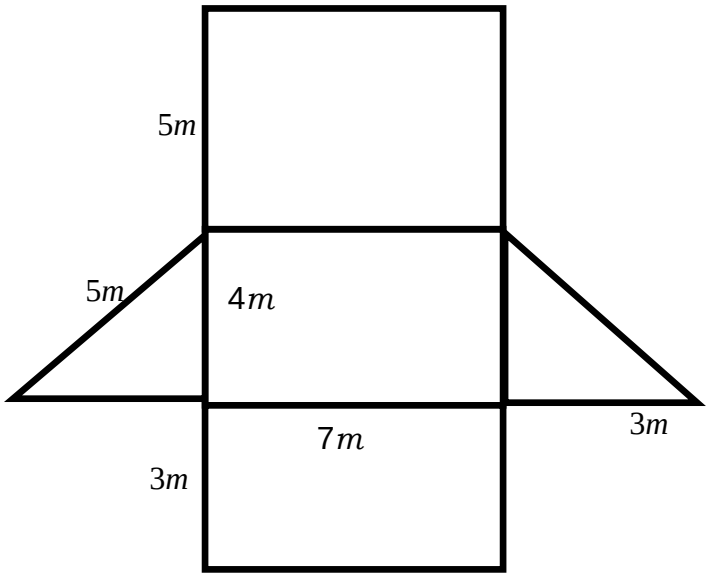
$= (3\ m)^2 + (4\ m)^2$ ✓

$= 9\ m^2 + 6\ m^2$ ✓

$= 25\ m^2$ ✓

BC = 5 *m* ✓ (4)

7.1.2



(1)

7.1.3 Surface Area = $(5\ m \times 7\ m) + (4\ m \times 7\ m) + 2(\frac{1}{2} \times 4 \times 3) + (3\ m \times 7\ m)$ ✓

$= 35\ m^2 + 28\ m^2 + 12\ m^2 + 21\ m^2$ ✓

$= 96\ m^2$ ✓ (3)

7.2

$160m \times x = 480\,000\ m^2$ ✓

$160xm = 48\,0000\ m^2$

$x = \frac{48\,0000\ m^2}{160\ m}$

$x = 3\,000\ m$ ✓

Length needed = $2(160\ m + 3\,000\ m)$ ✓

$= 6\,320\ m$ ✓ (4)

7.3 7.3.1 $V = 300\ cm \times 500\ cm \times 700\ cm$ ✓

$= 105\,000\,000\ cm^3$ ✓ (2)

7.3.2 Amount of water = $\frac{105\,000\,000\ cm^3}{1\,000}$ ✓

$= 105\,000\ l$ ✓ (2)

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QUESTION 8

8.1.1 4 , 8 , 12 , 12 , 16 , 16 , **16 , 24** , 24 , 32 , 32 , 36 , 48 , 48 ✓

Median $= \frac{16+24}{2}$ ✓

$= 20$ ✓ (3)

8.1.2 16 ✓ (1)

8.1.3 Range = 48 – 4 = 44 ✓ (1)

8.2 8.2.1 Both homework and sports ✓ 2 hours each OR 4 hours altogether ✓ (2)

8.2.2 Watching TV ✓ 1 hour ✓ (2)

8.3 8.3.1 P(B) $= \frac{3}{6}$ ✓$= \frac{1}{2}$ ✓ (2)

8.3.2 P(Not W) $= \frac{5}{6}$ ✓ (1)

[12]

TOTAL: 120