Grade 10 Mathematics: Memorandum Paper 2

1.1.1 A(–2; –5) ⇒ A′(–2; –5) ✔ 1

1.1.2 A(–2; –5) ⇒ A′(2; 5) ✔ 1

1.1.3 A(–2; –5) ⇒ A′(5; –2) ✔ ✔ 2

1.2.1 $AB = \sqrt{(3-5)^2 + (2-(-1))^2} =$

$= \sqrt{73}$ ✔ ✔

$= 8{,}54$ *units* 2

1.2.2 $M = \left(\frac{3+5}{2}; \frac{2+(-1)}{2}\right)$ ✔

$= \left(1; \frac{1}{2}\right)$ ✔ 2

1.2.3 If $m_{BC} = 2$

$m_{BC} = \frac{p-(-1)}{2-5} = 2$ ✔ ✔

$p + 1 = -6$

$p = -7$ ✔ 3

1.3.1 $\sin 53{,}14° = \frac{AB}{20}$ ✔

$\therefore AB = 20 \times \sin 53{,}14°$ 2

$= 16\ m$ ✔ 0

1.3.2 $\tan 53{,}14° = \frac{AB}{BC}$ ✔

$\therefore BC = \frac{AB}{\tan 53{,}14°} = \frac{16}{\tan 53{,}14°}$ ✔ 2

1.4.1 $V = 18 \times 5 \times x$ ✔

$= 90x\ cm^3$ ✔ 2

1.4.2 New $V = 2 \times (18 \times 5) \times x$

$\therefore$ new breadth $= 2x$ ✔ 1

1.5.1 $\text{Mean} = \frac{63+32+34+64+32+27+35}{7}$ ✔

$= 41$ ✔ 2

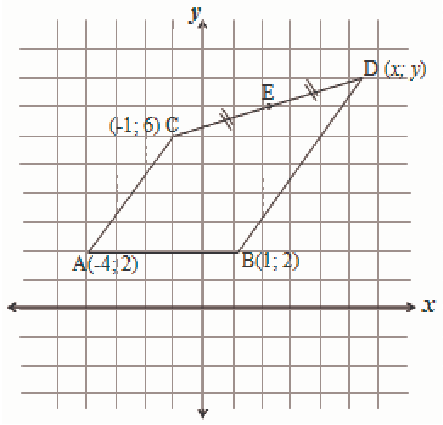
1.5.2 Mode = 32 ✔ (it occurs most often) 1

1.5.3 Ages in order: 27; 32; 32; 34; 35; 63; 64 ✔

Median = 34 ✔ 2

1.5.4 63 ✔ ✔ 2

2.1



AB = 5 units (since $m_{AB} = 0$) ✔

$BC = \sqrt{(-1+4)^2 + (6-2)^2}$ ✔

$= \sqrt{20}$ ✔ 3

2.2 ΔABC isosceles ✔ because AB = AC ✔ 2

2.3 Solution 1:
For ΔABC isosceles to be a right angled isosceles triangle the two equal angles must be 45° ✔ . In a triangle the longest side is always opposite the largest angle ✔ so in this triangle the longest side should be opposite the 90°. ✔ However, $\sqrt{20} < 5$, ✔ so ΔABC cannot be a right angled isosceles triangle. ✔
Or solution 2:
AB = AC,
$\therefore$ if ΔABC is right-angled, $\hat{A} = 90°$ ✔

$m_{AC} = \frac{6-2}{-1-(-4)} = \frac{4}{3}$ ✔

$m_{AB} = 0$ ✔

$m_{AB} \cdot m_{AC} = -1$ $\therefore$ ✔ $\hat{A} \neq 90°$ ✔

$\therefore$ ΔABC is NOT right-angled ✔ 5

2.4 $E = \left(\frac{x+1}{2}; \frac{y+6}{2}\right) = (2\frac{1}{4}; 7)$

$\therefore \frac{x-1}{2} = \frac{9}{4}$ *and* $\frac{y+6}{2} = 7$ ✔

$x - 1 = \frac{9}{2}$ $y + 6 = 14$

$x = \frac{11}{2} (or\ 5\frac{1}{2})$ $y = 8$

$\therefore D = (5\frac{1}{2}; 8)$ ✔ ✔ 3

2.5 $m_{AC} = \frac{6-2}{-1-(-4)} = \frac{4}{3}$ ✔

$m_{AB} = 0$ ✔

$m_{BD} = \frac{8-2}{5\frac{1}{2}-1} = \frac{4}{3}$ ✔

$m_{CD} = \frac{8-6}{5\frac{1}{2}-(-1)} = \frac{4}{13}$ ✔

$\therefore$ ABDC is a trapezium (AC||BD) ✔ 5

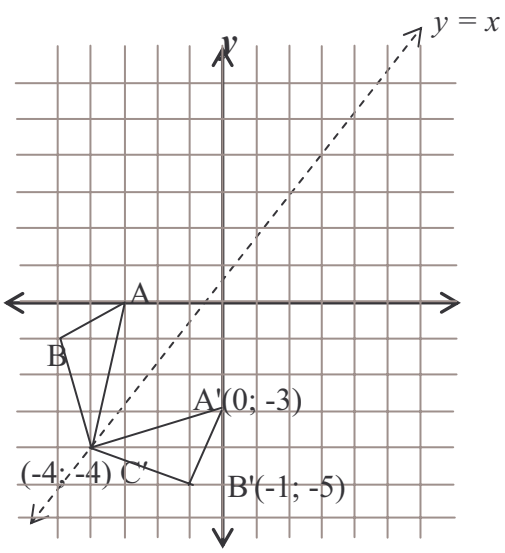
3.1.1 Δ2 is the reflection of Δ3 in the y-axis (and vice versa). ✔ ✔ 2

3.1.2 Δ1 is the reflection of Δ2 in the x-axis (and vice versa). ✔ ✔ 2

3.1.3 Δ2 is the reflection of Δ4 in the line $y = x$ (and vice versa). ✔ ✔ 2

3.2.1 Δ3 has been translated 2 units left and 1 unit up. ✔ ✔ 2

3.2.2



6

4.1 $\text{Vol}_{\text{Type B}} = 2 \times \text{Vol}_{\text{Type A}}$ ✔ ✔ 2

4.2 $\text{Vol}_{\text{Type C}} = 4 \times \text{Vol}_{\text{Type A}}$ ✔ ✔ 2

4.3 He must make the height four time as high. ✔ ✔ 2

4.3 SA = $2(5\times5) + 20 \times 11$ ✔ ✔
$= 270\ cm^2$ ✔ 3

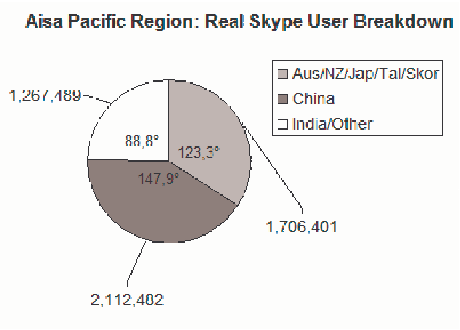
5.1 $\tan 3° = \frac{h}{2.9}$ ✔ ✔
$\therefore h = 2.9\times\tan 3°$ ✔
$\therefore h = 0{,}15\text{m}$ ✔ 4

5.2 $\sin\theta = \frac{1.4}{2.8}$ ✔ ✔
$\theta = 30°$ ✔ ✔ 4

5.3 Third side = $\sqrt{2{,}8^2 - 1{,}4^2}$ (pythag) ✔
$= 2{,}43\text{m}$ ✔
The roof is symmetrical ∴
width = 2 ×2,43
width of house is 4,86m ✔
3

5.4 $\tan 15° = \frac{h}{2.9}$ ✔
$\therefore h = 2.9\times\tan 15°$
$\therefore h = 0{,}78\text{m}$ ✔
Impact: 0,78m ÷ 0,15m = 5,18 ✔ ✔
h becomes about 5,2 times larger. 4

6.1



✔ ✔ ✔ for each of the 3 angles
✔ for title
✔ key/ correct labeling 5

6.2 2,311,409 ÷ 21,398,007 × 360°
= 39,22° ✔ ✔ 2

6.3 $\frac{2}{9} \times 21\ 398\ 007$
$\approx 4\ 755\ 112$ ✔
This is approximately the number of users in the South American region. ✔ 2

6.4.1 40 000words ✔ 1

6.4.2 The 4th group (12000 to 16000 words) is the modal group as it has the highest frequency. ✔ 1

6.4.3 150 data values
∴ median is the 75,5th value ✔
4+9+23+36 = 72
This lies in the 5th class ✔ 2

6.4.4 Estimated mean
= (4×2 000 + 9×6 000 + 23×10 000 + 36×14 000 + 28×18 000 + 17×22 000 + 14×26 000 + 11×30 000 + 6×34 000 + 2×38 000) ÷ 150
✔ ✔ ✔
= 2 648 000 ÷ 150 ✔
= 1 7653 words ✔ 5