

Western Mathematics Exams

School Name

Yearly Examination

2016

Year 10

Mathematics Course

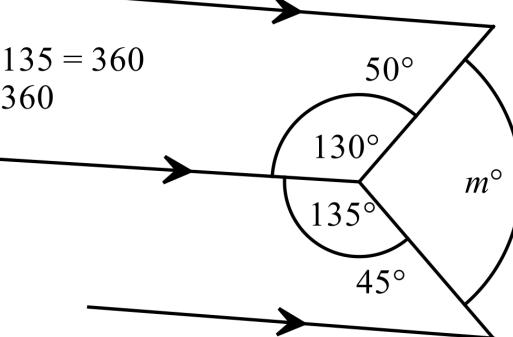
Solutions

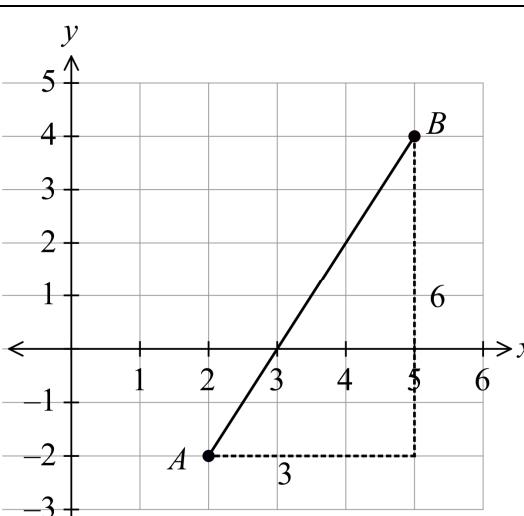
WME Solutions
**Year 10 Mathematics Yearly
 2016**

Non Calculator

Section 1 Short Answer Section

ANSWERS

No.	WORKING	ANSWER
1.	$\begin{aligned} \text{Percentage children} &= \frac{28}{35} \times 100\% \\ &= \frac{4}{5} \times 100\% \\ &= 80\% \end{aligned}$	80%
2.	$\begin{aligned} \frac{7}{8} \text{ of } 72 &= \frac{7}{8} \times 72 \\ &= 63 \end{aligned}$	63
3.	$\begin{aligned} \frac{-42 + 18}{-3} &= \frac{-24}{-3} \\ &= 8 \end{aligned}$	8
4.	$\begin{aligned} m + 130 + 135 &= 360 \\ m + 265 &= 360 \\ m &= 95 \end{aligned}$ 	$m = 95$
5.	$\begin{aligned} x + 2x + 3x + 4x &= 360^\circ \text{ (angle sum quadrilateral)} \\ 10x &= 360 \\ x &= 36 \end{aligned}$	$x = 36$
6.	Glasgow is 9 hours behind, so Sydney is 9 hours ahead of 1:45 pm, which is 10:45 pm on Saturday 12 th November.	10:45 pm on Saturday 12 th Nov

7.	$\text{Area} = \frac{h}{2}(a + b)$ $540 = \frac{h}{2}(24 + 36)$ $540 = \frac{h}{2}(60)$ $30h = 540$ $h = \frac{540}{30} = 18 \text{ cm}$	18 cm
8.	$\text{Area of top of slab} = 5 \text{ squares each } 3 \text{ m} \times 3 \text{ m}$ $= 5 \times 9$ $= 45 \text{ m}^2$ $\text{Volume of Slab} = 45 \times 0.2$ $= 9.0 \text{ m}^3$	9 m^2
9.	$T = \frac{mv^2}{L}$ $= \frac{100 \times 3^2}{6}$ $= \frac{100 \times 9}{6} \quad OR = \frac{900}{6}$ $= 150$	150
10.	$4ab - 3a(2a - 4b) = 4ab - 3a(2a - 4b)$ $= 4ab - 6a^2 + 12ab$ $= 16ab - 6a^2$	$16ab - 6a^2$
11.	$\text{Gradient} = \frac{\text{rise}}{\text{run}}$ $= \frac{6}{3}$ $= 2$ 	2
12.	$27^{-\frac{1}{3}} = \frac{1}{\sqrt[3]{27}} = \frac{1}{3}$	$\frac{1}{3}$

13.	$3d - 12 = 18 - 2d$ $5d - 12 = 18$ $5d = 30$ $d = \frac{30}{5} = 6$	$d = 6$
14.	Total number of Photos = $12 + 18 + 15 + 16 + 9 + 10 = 80$ Percentage from Bea = $\frac{16}{80} \times \frac{5}{1} = 4 \times 5 = 20\%$	20%
15.	Mean = $\frac{80}{6} = 13\frac{2}{6} = 13\frac{1}{3}$	$13\frac{1}{3}$
16.	2 hours and 20 min : 1 hour and 45 min = $140 \text{ min} : 105 \text{ min}$ = $\frac{140}{5} : \frac{105}{5}$ = $28 : 21$ = $4 : 3$	$4 : 3$
17.	Midpoint of interval joining $P(-6, 10)$ and $Q(4, 5)$ $MP = \left(\frac{-6+4}{2}, \frac{10+5}{2} \right)$ = $\left(\frac{-2}{2}, \frac{15}{2} \right)$ = $\left(-1, 7\frac{1}{2} \right)$	$\left(-1, 7\frac{1}{2} \right)$
18.	$\cos A = \frac{A}{H} = \frac{15}{17}$	$\frac{15}{17}$
19.	Surface Area = $22 \times 10 \times 2 + 22 \times 20 \times 2 + 10 \times 20$ = $440 + 880 + 200$ = 1520 cm^2	1520 cm^2
20.	Volume = $\frac{1}{3} \times A \times h$ = $\frac{1}{3} \times 3 \times 3 \times 1.2$ = 3.6 m^3	3.6 m^3

21.		The image $P'Q'R'S'$ is drawn accurately.
22.	$P(\text{divisible by } 3) = \frac{3}{10}$	$\frac{3}{10}$
23.	$\begin{aligned} \text{Gradient } m &= \frac{\text{rise}}{\text{run}} \\ &= \frac{6}{2} = 3 \\ y \text{ intercept} &= 6 \\ \text{Equation } y &= mx + b \\ y &= 3x + 6 \end{aligned}$	$y = 3x + 6$
24.	$\begin{aligned} x^2 + y^2 &= r^2 \\ x^2 + y^2 &= 6^2 \\ r &= 6 \end{aligned}$ <p>Centre is the origin.</p>	See the graph.

25.

$$\begin{aligned}\frac{BX}{DX} &= \frac{AX}{CX} \\ \frac{8+12}{12} &= \frac{x+18}{18} \\ \frac{20}{12} &= \frac{x+18}{18} \\ x+18 &= 18 \times \frac{20}{12} \\ x+18 &= 3(18) \times \frac{10(20)}{12} \\ x+18 &= 30 \\ x &= 30 - 18 = 12\end{aligned}$$

$$x = 12$$

Year 10

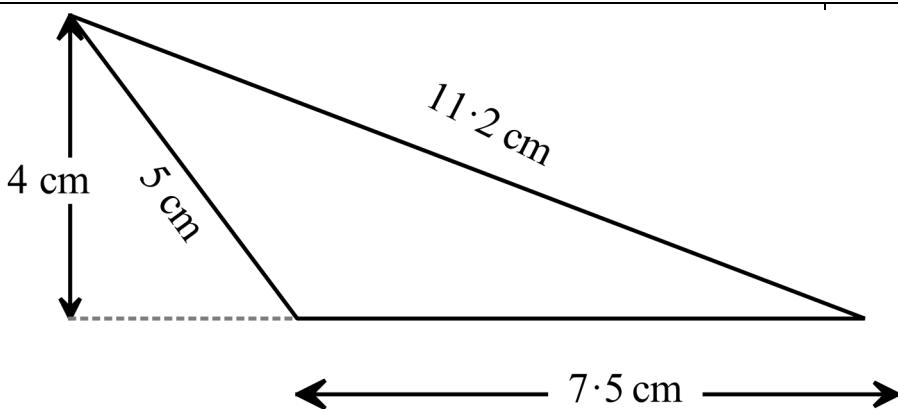
WME Solutions
Mathematics
Yearly 2016

Calculator Allowed

Section 2 Part A Multiple Choice Section**ANSWERS**

No.	WORKING	ANSWER																								
26.	$\frac{3}{8} = \frac{6}{16} = \frac{9}{24} = \frac{12}{32} = \frac{15}{40}$	D																								
27.	$8 \overline{)2.4}$ Amount in each glass is 0.3 litres	B																								
28.	Amount after tax = $0.7 \times 112\ 320$ = \$78 624 Weekly pay = $\$78\ 624 \div 52$ = \$1 512	B																								
29.	Profit = $264 - 160$ = \$104 Percentage profit = $\frac{104}{160} \times 100\%$ = 65%	C																								
30.	<table border="1"> <tr> <td></td> <td></td> <td></td> <td>Square</td> </tr> <tr> <td></td> <td></td> <td>Rectangle</td> <td></td> </tr> <tr> <td></td> <td>Parallelogram</td> <td></td> <td></td> </tr> <tr> <td>Kite</td> <td></td> <td></td> <td></td> </tr> <tr> <td>The diagonals bisect one another.</td> <td>N</td> <td>Y</td> <td>Y</td> </tr> <tr> <td>The diagonals are unequal.</td> <td>Y</td> <td>Y</td> <td>N</td> </tr> </table>				Square			Rectangle			Parallelogram			Kite				The diagonals bisect one another.	N	Y	Y	The diagonals are unequal.	Y	Y	N	B
			Square																							
		Rectangle																								
	Parallelogram																									
Kite																										
The diagonals bisect one another.	N	Y	Y																							
The diagonals are unequal.	Y	Y	N																							
31.	<p>Each side measures 2 metres – 200 cm.</p> <p>Volume = $200^3 = 8\ 000\ 000 \text{ cm}^3$</p> <p>Capacity = $8\ 000\ 000 \text{ mL}$ $= \frac{8000000}{1000} = 8000 \text{ L}$</p>	C																								

32.



Measurements could be taken in different directions to those shown, as long as the base and height are at right angles to one another.

$$\begin{aligned} \text{Area} &= \frac{1}{2} b h \\ &= \frac{1}{2} \times 7.5 \times 4 \\ &= 15 \text{ cm}^2 \end{aligned}$$

B

33.

$$\begin{aligned} 2az^2 - 15a^2 - 6az^2 + a^2 &= 2az^2 - 6az^2 - 15a^2 + a^2 \\ &= -4az^2 - 14a^2 \end{aligned}$$

D

34.

$$\begin{aligned} \text{In } \Delta ABZ \text{ and } \Delta EDZ \\ \text{ang}A = \angle E = 90^\circ \\ AZ = EZ \\ BZ = DZ \\ \therefore \Delta ABZ \equiv \Delta EDZ \text{ (RHS)} \end{aligned}$$

A

35.

$$\begin{aligned} -4a(3ab - 5bc) &= -4a \times 3ab - 4a \times (-5bc) \\ &= -12a^2b + 20abc \end{aligned}$$

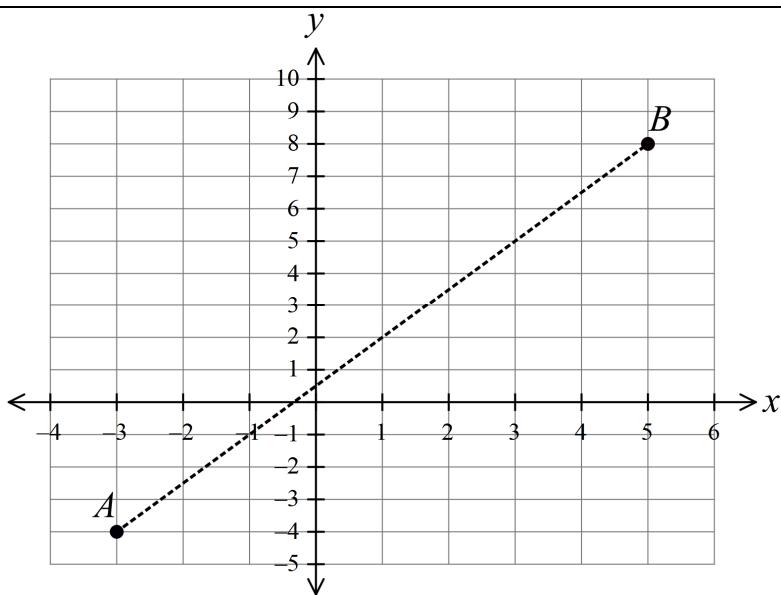
A

36.

$$\begin{aligned} 30\% \text{ of total angle} &= 30\% \text{ of } 360^\circ \\ &= \frac{30}{100} \times 360 = 108^\circ \\ \text{Fishing has an angle of } 108^\circ \end{aligned}$$

A

37.



D

$$\begin{aligned}AB^2 &= 8^2 + 12^2 \\&= 64 + 144 \\&= 208 \\AB &= \sqrt{208}\end{aligned}$$

38.

$$\begin{aligned}\left(\frac{48x^{11}}{3x^3}\right)^{\frac{1}{2}} &= \left(16x^8\right)^{\frac{1}{2}} \\&= 4x^4\end{aligned}$$

B

39.

$$\begin{aligned}2x &= \frac{2x - 10}{3} \\3 \times 2x &= \frac{3 \times (2x - 10)}{3} \\6x &= 2x - 10 \\4x &= -10 \\x &= -2.5\end{aligned}$$

B

40.

$$\begin{array}{ll}3 : 4.5 &= 30 : 45 \\&= 2 : 3 \\3 : 5.4 &= 30 : 54 \\&= 5 : 9\end{array} \quad \begin{array}{ll}3 : 4.8 &= 30 : 48 \\&= 5 : 8 \\3 : 5.5 &= 30 : 55 \\&= 6 : 11\end{array}$$

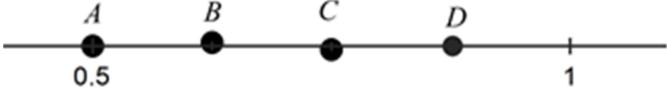
C

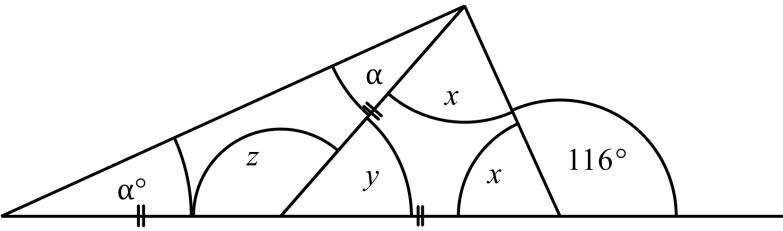
41.

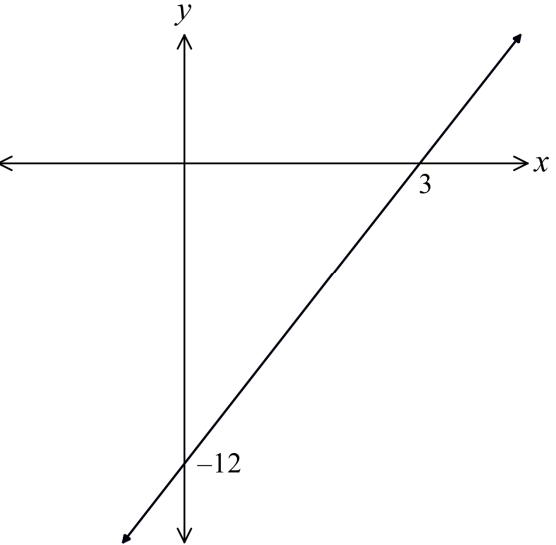
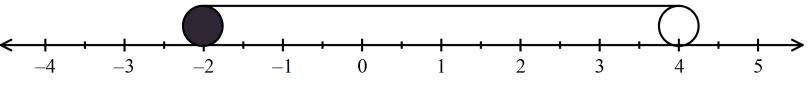
There are 20 with less than thirty spots.
There are 25 in the survey altogether.
Fraction with less than 30 spots = $\frac{20}{25} = \frac{4}{5}$

D

42.	<p>Median = 27 (13th score with 12 above and 12 below)</p> <p>Lower Quartile = (middle of lower 12 scores so 6th and 7th) = 26</p> <p>The median number of spots was 27 and the lower quartile was 26</p>	D
43.	$\tan \alpha^\circ = \frac{24}{60} = \frac{2}{5} = 0.4$ $\alpha = \tan^{-1}(0.4)$ $= 21.80141$ $= 22 \text{ (nearest whole number)}$	A
44.	$\cos 35^\circ = \frac{MN}{2.45}$ $MN = 2.45 \times \cos 35^\circ$ $= 2.00692251$ $= 2.01 \text{ km}$	C
45.	$A = P(1 + r)^n$ $= 30000(1.06)^4$ $= \$37874.3088$ $= \$37\,874.31$	D
46.	<p>Area for one tube = $2\pi r h$ $= 2 \times \pi \times 1.2 \times 30$ $= 226.194671$</p> <p>Area of 2 500 tubes = $226.194671 \times 2\,500$ $= 565486.677$ $= 565\,000 \text{ cm}^2 \text{ (nearest thousand cm}^2\text{)}$</p>	C

47.	<p>Area of cross section = $15 \times 24 + \frac{1}{2} \times 24 \times 15$ $= 360 + 180$ $= 540 \text{ cm}^2$</p> <p>Volume of prism = 540×40 $= 21\,600 \text{ cm}^3$</p>	C
48.	<p>There are 13 letters in OPPORTUNITIES. There are 2 O's and 1 U.</p> $P(O \text{ or } U) = \frac{3}{13}$	C
49.	<p>A pair of similar triangles are formed.</p> $\frac{h}{5} = \frac{18}{3} = 6$ $h = 6 \times 5 = 30 \text{ m}$	D
50.	<p>She was away from home for 11.5 hours (7 before midday and 4.5 after)</p> <p>She stopped for half an hour on the way and was at the appointment for 2 hours a total of 2.5 hours.</p> <p>Time driving = $11.5 - 2.5 = 9$ hours</p>	A
51.	 $\frac{1}{2} = \frac{4}{8}$ $\frac{5}{8}$ $\frac{3}{4} = \frac{6}{8}$ $\frac{7}{8}$	B
52.	$I = PRN$ $672 = 6400 \times 0.06 \times N$ $672 = 384 \times N$ $N = \frac{672}{384}$ $= 1.75 \text{ years}$ $= 1 \text{ year and 9 months}$	B

53.	$\angle COD = 90 - 58 = 32^\circ$ (adjacent angles in right $\angle le$) $\angle COE = 32 + 45 = 77^\circ$ (adjacent $\angle l\emptyset$) $\angle GOF = \angle COE = 77^\circ$ (vert opp \angle) $\angle EOF = 180 - 77 = 103^\circ$ (angles on straight line) OTHER POSSIBLE REASONING	A
54.	 $x = 180 - 116 = 64^\circ$ (angles on st line) $2x + y = 180^\circ$ (angles in isosceles Δ) $128 + y = 180$ $y = 180 - 128 = 52$ $2\alpha = 52$ (exterior angle isos Δ) $\alpha = 26^\circ$ (or find z first $z = 180 - 52 = 128$) (or $z = 2x = 2 \times 64 = 128$) $2\alpha + 128 = 180$ $2\alpha = 52$ $\alpha = 26$	B
55.	$SV = IV(1 - r)^n$ $SV = 36000(1 - 0.12)^4$ $= 36000(0.88)^4$ $= \$21\,589.03$	B
56.	$3x - 5x^2 + 2x(3 - 4x) = 3x - 5x^2 + 6x - 8x^2$ $= 9x - 13x^2$	D
57.	$8ax^3 - 12ax^2 = 4ax^2(2x - 3)$ $= 2ax \times 2x(2x - 3)$ So $2ax$, $4ax^2$, and $(2x - 3)$ are factors and $8x$ is not.	A
58.	$\frac{3x}{4} \div \frac{6x}{5} = \frac{3x}{4} \times \frac{5}{6x}$ $= \frac{15x}{24x}$ $= \frac{5}{8}$	A

59.	<p>Gradient $m = \frac{12}{3}$ $m = 4$</p> <p>y intercept $b = -12$</p> <p>Equation $y = 4x - 12$</p> 	D
60.	<p>Percentage = $\frac{6.42 \times 10^{23}}{5.97 \times 10^{24}} \times 100$ $= 10.753768844221105527638190954774$ $= 10.8\% \text{ (correct to 3 sig fig)}$</p>	A
61.	<p>$-2 \leq x < 4$</p> <p>-2 is included, so is shaded and 4 is not so is not shaded, and x lies between these two, so the line joins -2 and 4.</p> 	B

<p>62.</p> <p>As the lower quartile, lower extreme and median are more closely groups than the upper quartile and upper extreme, the scores are more bunched toward the lower values, so the tail is toward the top, so it is positively skewed.</p>	<p>C</p>
<p>63.</p> <p>67 is the first quartile, so three-quarters of the scores will be equal or higher.</p> $\frac{3}{4} \times 48 = 36$	<p>D</p>
<p>64.</p> <p>Probability from Birch Downs = $\frac{65}{250} = 0.26$ Probability not from Birch Downs = $1 - 0.26 = 0.74$</p>	<p>C</p>
<p>65.</p> <p>Bearing of Daedalus = $270^\circ - 34^\circ = 236^\circ$</p>	<p>D</p>
<p>66.</p> $\cos 25^\circ = \frac{140}{KL}$ $KL \times \cos 25^\circ = 140$ $KL = \frac{140}{\cos 25^\circ}$ $= 154.47291$ $= 154 \text{ m (nearest m)}$	<p>A</p>
<p>67.</p> $\angle STW = 180 - (24 + 107) = 180 - 131 = 49^\circ$ $\angle STU = 180 - (24 + 49) = 180 - 73 = 107^\circ$ <p>\therefore The angles in $\triangle STU$ are $24^\circ, 49^\circ$ and 107° and The angles in $\triangle STW$ are $24^\circ, 49^\circ$ and 107° $\therefore \triangle STW \parallel \triangle STU$</p>	<p>A</p>

68.	$\begin{aligned} \text{Speed} &= \frac{750}{3} \text{ m/min} \\ &= 250 \text{ m/min} \\ &= 15000 \text{ m/h} \\ &= 15 \text{ km/h} \end{aligned}$	D
69.	<p>Interest rate = 7.2% pa = 0.6% per month</p> <p>Period = 4 years = 48 months</p> $\begin{aligned} A &= P(1 + r)^n \\ &= 30000(1.0006)^{48} \\ &= \$39978.30061 \\ &= \$39\,978.30 \end{aligned}$	C
70.	<p>$y = 2x + 4$ has a gradient $m = 2$</p> <p>the parallel line will have the same gradient</p> <p>It will be of the form</p> $y = 2x + b$ <p>And since passes through (2, -6)</p> $\begin{aligned} -6 &= 2(2) + b \\ -6 &= 4 + b \\ b &= -10 \end{aligned}$ <p>Equation $y = 2x - 10$</p>	C
71.	$\begin{aligned} \frac{3^{-5} \times 9}{\sqrt{3} \div 27} &= \frac{3^{-5} \times 3^2}{3^{\frac{1}{2}} \div 3^3} \\ &= \frac{3^{-5+2}}{3^{\frac{1}{2}-3}} \\ &= \frac{3^{-3}}{3^{-\frac{5}{2}}} \\ &= 3^{-3 - (-2\frac{1}{2})} \\ &= 3^{-\frac{1}{2}} \\ &= \frac{1}{\sqrt{3}} \end{aligned}$	B

72.	<p>Number of mistakes for those 16 and under – 17, 18, 18, 14, 17, 15, 15, 11</p> $\text{Mean} = \frac{17 + 18 + 18 + 14 + 17 + 15 + 15 + 11}{8}$ $= \frac{125}{8}$ $= 15.625$	D
73.	<p>The dots on the graph quite clearly follow a linear shape (straight line) so it is a strong relationship, and the number of mistakes decreases as the age increases so the relationship is negative.</p> <p>So there is a strong negative relationship between age and number mistakes.</p>	A
74.	<p>The graph has a y intercept of about 11, so only B and D have this.</p> <p>The graph is exponential so equation is B $y = 2^x + 10$</p> <p>Or by testing a second point e.g. when $x = 6$</p> <p>B. $y = 2^6 + 10 = 64 + 10 = 74$</p> <p>D. $y = 6^2 + 11 = 36 + 11 = 47$</p> <p>On Graph, when $x = 6, y = 74$ so correct graph is B.</p>	B
75.	<p>A parabola has a term in x^2 (or y^2) only, so correct equation is $y = x^2 + 10$</p>	C

School Name
Year 10 Mathematics Examination
Solutions 2016
Multiple Choice Section Answer Sheet

Name Marking Sheet

Teacher _____

Completely fill the response oval representing the most correct answer.

Use a black or blue pen or 2B pencil.

- | | |
|--|--|
| 26. A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input checked="" type="radio"/> | 51. A <input type="radio"/> B <input checked="" type="radio"/> C <input type="radio"/> D <input type="radio"/> |
| 27. A <input type="radio"/> B <input checked="" type="radio"/> C <input type="radio"/> D <input type="radio"/> | 52. A <input type="radio"/> B <input checked="" type="radio"/> C <input type="radio"/> D <input type="radio"/> |
| 28. A <input type="radio"/> B <input checked="" type="radio"/> C <input type="radio"/> D <input type="radio"/> | 53. A <input checked="" type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> |
| 29. A <input type="radio"/> B <input type="radio"/> C <input checked="" type="radio"/> D <input type="radio"/> | 54. A <input type="radio"/> B <input checked="" type="radio"/> C <input type="radio"/> D <input type="radio"/> |
| 30. A <input type="radio"/> B <input checked="" type="radio"/> C <input type="radio"/> D <input type="radio"/> | 55. A <input type="radio"/> B <input checked="" type="radio"/> C <input type="radio"/> D <input type="radio"/> |
| 31. A <input type="radio"/> B <input type="radio"/> C <input checked="" type="radio"/> D <input type="radio"/> | 56. A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input checked="" type="radio"/> |
| 32. A <input type="radio"/> B <input checked="" type="radio"/> C <input type="radio"/> D <input type="radio"/> | 57. A <input checked="" type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> |
| 33. A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input checked="" type="radio"/> | 58. A <input checked="" type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> |
| 34. A <input checked="" type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> | 59. A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input checked="" type="radio"/> |
| 35. A <input checked="" type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> | 60. A <input checked="" type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> |
| 36. A <input checked="" type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> | 61. A <input type="radio"/> B <input checked="" type="radio"/> C <input type="radio"/> D <input type="radio"/> |
| 37. A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input checked="" type="radio"/> | 62. A <input type="radio"/> B <input type="radio"/> C <input checked="" type="radio"/> D <input type="radio"/> |
| 38. A <input type="radio"/> B <input checked="" type="radio"/> C <input type="radio"/> D <input type="radio"/> | 63. A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input checked="" type="radio"/> |
| 39. A <input type="radio"/> B <input checked="" type="radio"/> C <input type="radio"/> D <input type="radio"/> | 64. A <input type="radio"/> B <input type="radio"/> C <input checked="" type="radio"/> D <input type="radio"/> |
| 40. A <input type="radio"/> B <input type="radio"/> C <input checked="" type="radio"/> D <input type="radio"/> | 65. A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input checked="" type="radio"/> |
| 41. A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input checked="" type="radio"/> | 66. A <input checked="" type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> |
| 42. A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input checked="" type="radio"/> | 67. A <input checked="" type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> |
| 43. A <input checked="" type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> | 68. A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input checked="" type="radio"/> |
| 44. A <input type="radio"/> B <input type="radio"/> C <input checked="" type="radio"/> D <input type="radio"/> | 69. A <input type="radio"/> B <input type="radio"/> C <input checked="" type="radio"/> D <input type="radio"/> |
| 45. A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input checked="" type="radio"/> | 70. A <input type="radio"/> B <input type="radio"/> C <input checked="" type="radio"/> D <input type="radio"/> |
| 46. A <input type="radio"/> B <input type="radio"/> C <input checked="" type="radio"/> D <input type="radio"/> | 71. A <input type="radio"/> B <input checked="" type="radio"/> C <input type="radio"/> D <input type="radio"/> |
| 47. A <input type="radio"/> B <input type="radio"/> C <input checked="" type="radio"/> D <input type="radio"/> | 72. A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input checked="" type="radio"/> |
| 48. A <input type="radio"/> B <input type="radio"/> C <input checked="" type="radio"/> D <input type="radio"/> | 73. A <input checked="" type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> |
| 49. A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input checked="" type="radio"/> | 74. A <input type="radio"/> B <input checked="" type="radio"/> C <input type="radio"/> D <input type="radio"/> |
| 50. A <input checked="" type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> | 75. A <input type="radio"/> B <input type="radio"/> C <input checked="" type="radio"/> D <input type="radio"/> |

Year 10	<i>WME Solutions Mathematics Yearly 2016</i>	Calculator Allowed
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Section 2 Part B Longer Answer Section

ANSWERS

			Marks
76.	a)	There are 21 scores, so 21 players	1 mark for correct answer
	b)	The sum of the scores = 1029 $\text{Mean} = \frac{1029}{21} = 49$	1 mark for correct answer
	c)	Median is the 11 th score (10 above and 10 below) Median = 48	1 mark for correct answer
	d)	Lower quartile = $\frac{39 + 40}{2} = 39.5$ (5 th and 6 th scores) Upper quartile = $\frac{56 + 58}{2} = 57$ (16 th and 17 th scores) Interquartile range = $57 - 39.5 = 17.5$	1 mark for correct answer
77.	a)	Volume = $A h$ $= \left(\frac{1}{2} \times 10 \times 12\right) \times 16$ $= 960 \text{ cm}^3$	1 mark for correct answer
	b)	Find slant height l $l^2 = 5^2 + 12^2$ $= 25 + 144 = 169$ $l = \sqrt{169} = 13$ Surface Area = $\frac{1}{2} \times 10 \times 12 \times 2 + 16 \times 13 \times 2 + 10 \times 16$ $= 120 + 416 + 160$ $= 696 \text{ cm}^2$	2 marks for correct answer 1 mark for an answer calculated using the wrong slant height or which has another similar simple error.

78.	a)	$2(4p - 3) = 4p - 17$ $8p - 6 = 4p - 17$ $4p - 6 = -17$ $4p = -11$ $p = -2.75$	<p>2 marks for correct answer found by any valid method including trial and error.</p> <p>1 mark for an incorrect answer which has valid working toward answer with minor error in algebra or calculation</p>
	b)	$(c + 4)(c - 2) = 0$ $c = -4 \text{ or } c = 2$	1 mark for correct answer
	c)	Sub $y = 4$ into $y = 3x - 5$ $4 = 3x - 5$ $3x = 9$ $x = 3$ Point (3, 4)	1 mark for correct answer
79.		$A = 59\ 100$ Three years at 8% pa quarterly so $n = 3 \times 4 = 12$ $r = 0.08 \div 4 = 0.02$ $A = P(1 + r)^n$ $59100 = P(1.02)^{12}$ $59100 = 1.26824 \times P \text{ (rounded to 6 s. f.)}$ $P = \frac{59100}{1.26824}$ $P = 46599.95$ $P = 46\ 600 \text{ (to nearest dollar)}$	<p>2 marks for correct answer found by any valid method including trial and error using the formula.</p> <p>1 mark for an incorrect answer which uses the compound interest formula but has an error in substitution, calculation or in changing to the quarterly rates.</p>

80.		<p> $\angle EDF = \angle AED = 20^\circ$ (alt \angle on \parallel lines) $\angle DFE = \angle FED$ (isosceles Δ) $20^\circ + 2 \times \angle DFE = 180^\circ$ (angle sum Δ) $\angle DFE = \frac{180 - 20}{2} = 80^\circ$ $2x + 80 = 180$ (\angle on straight line) $2x = 100$ $x = 50^\circ$ </p>	<p>2 marks for correct answer with reasoning.</p> <p>1 mark for an incorrect answer which has working which includes some correct and relevant reasoning</p>
81.	a)	$\tan 40^\circ = \frac{101}{AD}$ $AD = \frac{101}{\tan 40^\circ}$ $= 120.3671128$ $= 120 \text{ m (nearest metre)}$	1 mark for correct answer
	b)	$\tan F = \frac{101}{160}$ $F = \tan^{-1} \left(\frac{101}{160} \right)$ $= 32.262169296$ $= 32^\circ \text{ (nearest degree)}$	1 mark for correct answer
	c)	$\angle EBA = 25^\circ$ $\sin \angle EBA = \frac{AE}{AB}$ $\sin 25^\circ = \frac{AE}{200}$ $AE = 200 \sin 25^\circ$ $= 84.52365$ $= 85 \text{ m (nearest metre)}$ <p>Height of balloon above ground = $85 + 101$ m $= 186 \text{ m}$</p>	<p>2 marks for correct answer</p> <p>1 mark for an answer with a minor error or which only finds the distance AE.</p>
82.	a)	The intercepts are $x = -2$ and $x = 2$.	1 mark for correct answer

	b)	<p>From the points $(-2, 0)$ and $(0, 1)$ Rise = 1 Run = 2 Gradient = $\frac{1}{2}$ Or using formula with two points $m = \frac{1-0}{0-(-2)} = \frac{1}{2}$</p>	1 mark for correct answer
	c)	<p>Graph showing a parabola $y = x^2 - 4$ and a line k. The parabola passes through points $(-2, 0)$, $(-1, -1)$, $(0, -4)$, $(1, -1)$, and $(2, 0)$. The line k passes through the origin $(0, 0)$ and has a gradient of $\frac{1}{2}$, passing through points $(-2, -1)$, $(-1, -3/2)$, $(0, 0)$, $(1, 3/2)$, and $(2, 2)$.</p> <p>Gradient = -2 (either from graph or $m_1 \cdot m_2 = -1$) y intercept = 0 Equation $y = -2x$</p>	1 mark for correct line drawn on number plane 1 mark for correct equation
83.	a)	$P(\text{Walking}) = 16\% + 28\% = 44\%$ Can be written as 0.44 or $\frac{11}{25}$	1 mark for correct answer
	b)	$P(\text{Not Walking and Cycling}) = 100\% - 16\% = 84\%$ Can be written as 0.84 or $\frac{21}{25}$	1 mark for correct answer