

Question 1

- 1.1 10 13 13 17 18 19 20 21 22 23 24  
 26 27 30 32 ✓

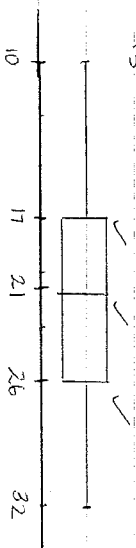
median = 21 ✓

(2)

2  $Q_1 = 17$  ✓

$Q_3 = 26$  ✓

(2)  
(4)



- 4 The range of distances traveled by Thabo and Sean is the same. Both sets of data are skewed to the right. Thabo's median is larger than Sean's. ✓

(2)

Question 2

- 1 Diag sheet  
 2 Diag sheet

(4)  
(2)

- 3 As women get older, the trend is that they spend less money on clothing items ✓

(1)

- 4 ~~Plot~~ 175 MPD - 175

(2)

Question 3

3.1 mean =  $\frac{847}{11}$  ✓

= 77 am ✓

(2)

- 3.2 Diag sheet

(4)

3 Var =  $\frac{1290}{11}$  ✓

= 117,27 ✓

(2)

- 4 std deviation =  $\sqrt{\text{Var}}$

=  $\sqrt{117,27}$   
 = 10,83 ✓

(1)

Question 4

4.1 BC =  $\sqrt{(6+5)^2 + (3-0)^2}$  ✓

=  $\sqrt{121+9}$   
 =  $\sqrt{130}$  ✓

(3)

4.2  $M_{AB} = \frac{4-0}{3+5}$  ✓

=  $\frac{4}{8}$   
 =  $\frac{1}{2}$  ✓

$y - y_1 = m(x - x_1)$  ✓

$y - 0 = \frac{1}{2}(x + 5)$  ✓

$y = \frac{1}{2}x + \frac{5}{2}$  ✓

(1)

Question 5

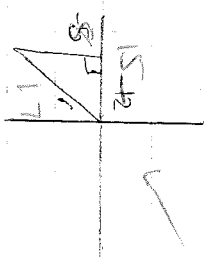
- 1.1 Diagram sheet  
 $(x, y) \rightarrow (2x-2, 2y+8)$  (4)
- 2.1  $(-5, -4)$  rotated  $90^\circ$  anticlockwise about the origin (3)
- 2.2  $(-12, 15)$  rotated  $180^\circ$  and enlarged by a factor of 3 (4)

Question 6

- 1.1 Volume of cylinder =  $\pi r^2 h$   
 $= \pi (7.5)^2 (25)$   
 $= 4417,86 \text{ cm}^3$  (2)
- Volume of sphere =  $\frac{4}{3} \pi r^3$   
 $= \frac{4}{3} \pi (6)^3$  (3)  
 $= 904,78 \text{ cm}^3$  (2)
2.  $V = 4417,86 - 904,78$  (1)  
 $= 3513,08 \text{ cm}^3$  (1)
- 2.1 Volume will be increased by  $3^3$  (1)
- 2.2  $V = \frac{4}{3} \pi (3r)^3$  (1)  
 $= 27 (\frac{4}{3} \pi r^3)$  (2)

Question 4

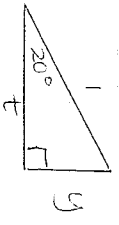
- 7.1  $r^2 = (-5)^2 + (-5)^2$  ~~Pythagoras~~  
 $= 14 + 25$   
 $= 39$   
 $r = 13$  (3)
- 7.2  $\sin^2(90-\beta) = 1$   
 $= \cos^2 \beta = 1$   
 $= (-\frac{12}{13})^2 = 1$  (2)
- $\frac{144}{169} = 1$   
 $= \frac{25}{169}$  (3)
- 7.3  $\sin^2 \beta = (-\frac{5}{13})^2$   
 $= \frac{25}{169} = (-\frac{5}{17})^2$  (2)



Question 8

8.1.1  $\sin 70^\circ = \sin(90 - 20)$  ✓

$= \cos 20$  ✓  
 $= t$  ✓



$\cos 20^\circ = \frac{t}{1}$

$\tan 20^\circ = \frac{\sqrt{1-t^2}}{t}$  ✓

$y^2 = 1 - t^2$  ✓  
 $y = \sqrt{1-t^2}$  ✓

8.2  $\tan 135^\circ \cdot \sin 230^\circ \cdot \tan(-60^\circ)$   
 $\cos 40^\circ \cdot \tan 300^\circ \cdot \sin 150^\circ$

$= \frac{\tan(180-45) \sin(180+50) (-\tan 60)}{\cos(180-40) \tan(360-60) \sin(180-30)}$   
 $= \frac{(-\tan 45)(-\sin 50)(-\tan 60)}{(-\cos 40)(-\tan 60)(-\sin 30)}$  ✓ ✓  
 $= \frac{-1(\cos 40)(-\frac{\sqrt{3}}{2})}{\sqrt{1-(\cos 40)^2}(-\frac{1}{2})(\frac{1}{2})}$  ✓  
 $= -\frac{1}{2}$  ✓  
 $= -2$  ✓

(8)

8.3

8.3.1

LHS =  $\tan \beta - \frac{\cos \beta}{\sin \beta}$   
 $= \frac{\sin \beta}{\cos \beta} - \frac{\cos \beta}{\sin \beta}$  ✓  
 $= \frac{\sin^2 \beta - \cos^2 \beta}{\cos \beta \cdot \sin \beta}$  ✓  
 $= \frac{(1-\cos^2 \beta) - \cos^2 \beta}{\cos \beta \cdot \sin \beta}$  ✓  
 $= \frac{1-2\cos^2 \beta}{\cos \beta \cdot \sin \beta}$   
 $= \text{RHS}$  ✓

8.3.2

$0^\circ, 90^\circ, 180^\circ$  ✓ ✓

(2)

(4)

Question 9

11

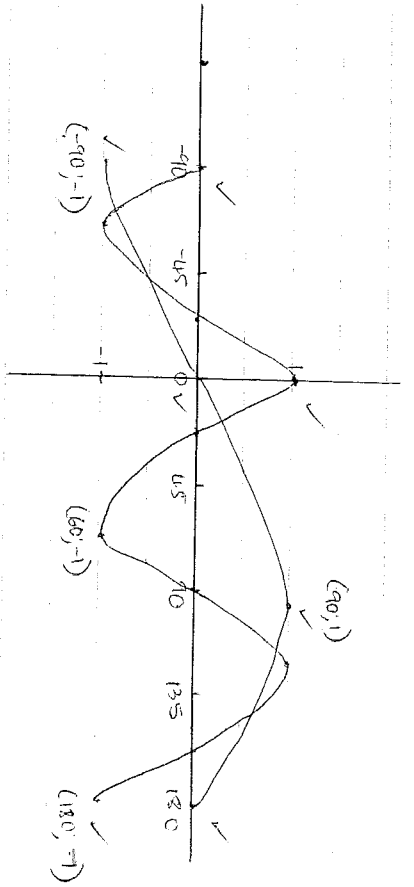
$\cos 2x = -2$   
 $\cos 2x = -\frac{2}{7}$  ✓

ref angle =  $73, 39845$  ✓  
 2nd Quad  
 $2x = 180 - 73, 39845$  ✓  
 $x = 53, 5^\circ$  ✓

3rd Quad  
 $2x = 180 + 73, 39845$  ✓  
 $x = 126, 7^\circ$  ✓

233,3  
 306,7

(6)



72

$\cos 3x = \sin 3x$  ✓

$\sin(90-3x) = \sin 3x$

$90-3x = x + k \cdot 360$  ✓

$-4x = -90 + k \cdot 360$

$x = 22,5^\circ - k \cdot 90$  ✓  $k \in \mathbb{Z}$

$x = -67,5^\circ; 22,5^\circ; 112,5^\circ$

OR  $90-3x = 180-x + k \cdot 360$

$-2x = 90 + k \cdot 360$  ✓

$x = -45^\circ - k \cdot 180$  ✓  $k \in \mathbb{Z}$

$x = -45^\circ; 135^\circ$  ✓ ✓

(3)

ALTERNATE SOLUTION

$(\cos 3x = \cos(90-3x))$  ✓

$3x = 90-x + k \cdot 360$  ✓

$4x = 90 + k \cdot 360$

$x = 22,5^\circ + k \cdot 90$  ✓  $k \in \mathbb{Z}$

$x = -67,5^\circ; 22,5^\circ; 112,5^\circ$

OR  $3x = 360-(90-3x) + k \cdot 360$  ✓

$2x = 270 + k \cdot 360$

$x = 135 + k \cdot 180$  ✓  $k \in \mathbb{Z}$

$x = -45^\circ; 135^\circ$  ✓ ✓

Question 10

10.1

$\frac{3}{DC} = \tan 40^\circ$  ✓

$DC = \frac{3}{\tan 40}$

$DC = 3,58 \text{ m}$  ✓

(2)

0.2

$BC^2 = BD^2 + DC^2 - 2BD \cdot DC \cdot \cos 113^\circ$  ✓

$BC^2 = (5,2)^2 + (3,58)^2 - 2(5,2)(3,58) \cos 113$  ✓

$BC^2 = 56,404101$  ✓

$BC = 7,38 \text{ m}$  ✓

(4)

1.3

Area  $\Delta BDC = \frac{1}{2} BD \cdot DC \cdot \sin BDC$  ✓

$= \frac{1}{2} (5,2)(3,58) \sin 113$  ✓

$= 8,56805$  ✓

(1)