

## TUTORIAL SHEET - LESSON (26)

Qu ①: Convert the following angles to "Radian" measure.

(i) $80^\circ$	(ii) $45^\circ$	(iii) $120^\circ$	(iv) $315^\circ$
$= 80^\circ \times \frac{\pi}{180^\circ}$	=	=	=
$= 4 \times \frac{\pi}{9}$	=	=	=
$= \frac{4\pi}{9}$	=	=	=

Qu ②: Convert the following angles to degrees:-

(i) $\frac{\pi}{3}$ radians	(ii) $\frac{3\pi}{2}$ radians	(iii) $\frac{7\pi}{9}$ rads.	(iv) 2 rads.
$= \frac{\pi}{3} \times \frac{180^\circ}{\pi}$	=	=	=
=	=	=	=

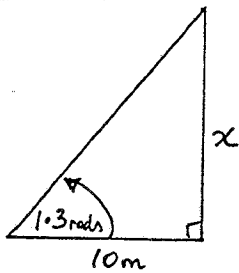
Qu ③ Evaluate (use "RAD" mode!)

(i) $\tan 1.8$	(ii) $\cos 3.7$	(iii) $\sin 0.4$	(iv) $\cos 2.6$
=	=	=	=

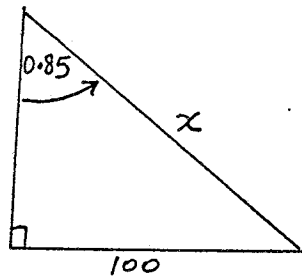
Qu ④ Solve; leaving answers in "radians" to 3 significant figures.

(i) $\cos x = 0.8$	(ii) $\tan x = 1.85$	(iii) $\sin x = 0.85$	
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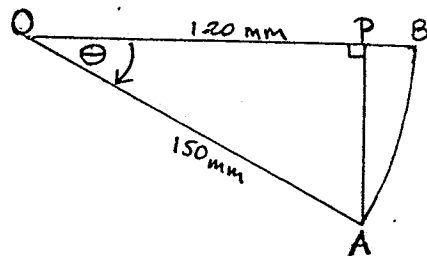
Quest ⑤



FIND x



FIND x



(i) Find  $\theta$

In Radians!

(ii) Find Arc length AB

### ANSWERS

- ①  $\frac{1}{4\pi} = 1.396$   $\frac{1}{\pi} = 0.785$   $\frac{1}{2\pi} = 2.094$   $\frac{1}{2\pi} = 5.498$  ②  $1.60^\circ$   $2.70^\circ$   $3.140^\circ$   $4.114.6^\circ$   
 ③  $1.4286$   $2. -0.8481$   $3. 0.3894$   $4. -0.8569$  ④  $1.0752$   $3. 1.0160$  radians  
 ⑤  $1.3602m$   $2. 133.1m$   $3. (i) 0.6435$  radians  $(ii) 96.5$  mm

1. Convert the following angles into degrees, mentally:

- |                     |                     |                      |                      |                       |
|---------------------|---------------------|----------------------|----------------------|-----------------------|
| (a) $\frac{\pi}{4}$ | (c) $\pi$           | (e) $\frac{\pi}{2}$  | (g) $\frac{\pi}{10}$ | (i) $\frac{5\pi}{12}$ |
| (b) $\frac{\pi}{3}$ | (d) $\frac{\pi}{6}$ | (f) $\frac{5\pi}{6}$ | (h) $\frac{2\pi}{3}$ | (j) $2\pi$            |

2. Express the following angles in circular measure in terms of  $\pi$ , mentally:

- |                |                 |                 |                 |                |
|----------------|-----------------|-----------------|-----------------|----------------|
| (a) $90^\circ$ | (c) $45^\circ$  | (e) $30^\circ$  | (g) $150^\circ$ | (i) $20^\circ$ |
| (b) $60^\circ$ | (d) $360^\circ$ | (f) $270^\circ$ | (h) $180^\circ$ | (j) $10^\circ$ |

3. Express the following angles in radians (correct to five significant figures):

- |                 |                    |                     |
|-----------------|--------------------|---------------------|
| (a) $47^\circ$  | (d) $23.78^\circ$  | (g) $61^\circ 38'$  |
| (b) $1^\circ$   | (e) $191.25^\circ$ | (h) $266^\circ 13'$ |
| (c) $342^\circ$ | (f) $0.01^\circ$   | (i) $00^\circ 01'$  |

4. Convert into degrees (correct to four decimal places):

- |               |                                |                              |
|---------------|--------------------------------|------------------------------|
| (a) 3 radians | (c) 2.0347 radians             | (e) $1.836\pi$ radians       |
| (b) 1 radian  | (d) $\frac{\pi}{2.64}$ radians | (f) $\frac{3\pi}{7}$ radians |

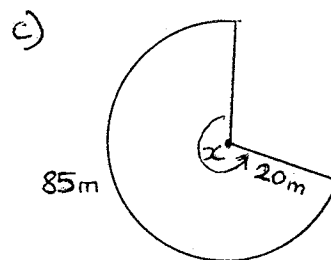
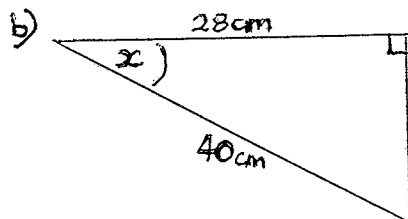
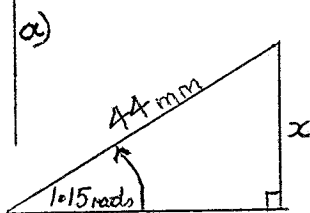
5. Express each of the following angles in degrees and minutes (correct to the nearest minute):

- |                     |                               |
|---------------------|-------------------------------|
| (a) 2 radians       | (c) 3.10682 radians           |
| (b) 1.38492 radians | (d) $\frac{2\pi}{13}$ radians |

6. Evaluate correct to four significant figures:

- |                     |                                |
|---------------------|--------------------------------|
| (a) $\sin 2.5326$   | (d) $\tan \frac{\pi}{1.62380}$ |
| (b) $\tan 0.68209$  | (e) $\sin -1.23\pi$            |
| (c) $\cos -2.34071$ |                                |

7. Find  $x$  - make sure you are in "RAD" mode.



**ANSWERS**

- ①  $45^\circ, 60^\circ, 180^\circ, 30^\circ, 90^\circ, 150^\circ, 18^\circ, 120^\circ, 75^\circ, 360^\circ, 360^\circ, 2\pi, \pi, \frac{3\pi}{2}, \frac{3\pi}{4}, \frac{5\pi}{6}, \frac{5\pi}{3}, \frac{7\pi}{6}, \frac{7\pi}{4}, \frac{11\pi}{6}, \frac{11\pi}{3}$   
 ②  $0.8203, 0.0176, 5.969, 0.4150, 3.3379, 1.745 \times 10^{-4}, 1.0757, 4.646, 2.909 \times 10^{-6}$   
 ③  $171.89^\circ, 57.30^\circ, 116.58^\circ, 68.18^\circ, 330.48^\circ, 77.14^\circ, 114.035', 79.01', 178.0', 27.042', 0.572, 0.8121, -0.6961, -2.625, 0.6613, 40.16 \text{ mm}, 0.7954 \text{ rads}, 4.25 \text{ rads}$