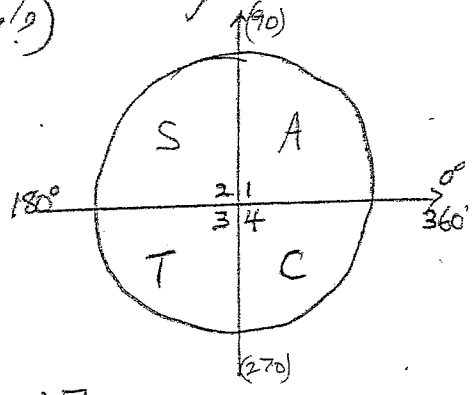
WORKSHEET ① - ASTC

① What is the equivalent acute angle to the following?
(ie what angle do they make with the horizontal?)

a) 170° b) 220° c) 355° d) 141°



② Give the equivalent TRIG. RATIO. to each of the following:—
[example: TAN 140° = −TAN 40° ('TAN' is negative in the 2ND quadrant)]

a) Sin 170° =
b) Sin 220° =
c) Sin 300° =
d) Tan 170° =
e) TAN 250° =
f) Cos 200° =
g) Cos 317° =
h) Cos (−10°) =
i) Tan(−160°) =

③ Solve for one complete revolution $0° \leq \theta < 360°$

(a) $\text{TAN}\theta = 0.6$

(b) $\sin\theta = -0.5$

(c) $4\cos\theta + 3 = 0$

WORK SHEET (2) – ASTC

Quest (1)

(a) Sketch $y = \sin x$ for the range $-360° \leq x \leq 360°$

(b) Sketch $y = \cos x$ for the range $-180 \leq x \leq 270°$

(c) Sketch $y = \tan x$ for the range $-180° \leq x \leq 180°$

Quest (2)

By finding the angle each one below makes with the horizontal, find the equivalent acute angle for :—

	General Angle	Acute Angle
(a)	$140°$	
(b)	$200°$	
(c)	$340°$	
(d)	$95°$	
(e)	$280°$	
(f)	$-210°$	

Quest (3)

Give exact values for the following :–

(a) $\sin 30° =$

(b) $\sin 150° =$

(c) $\sin 210° =$

(d) $\sin 330° =$

(e) $\tan 135° =$

(f) $\tan 240° =$

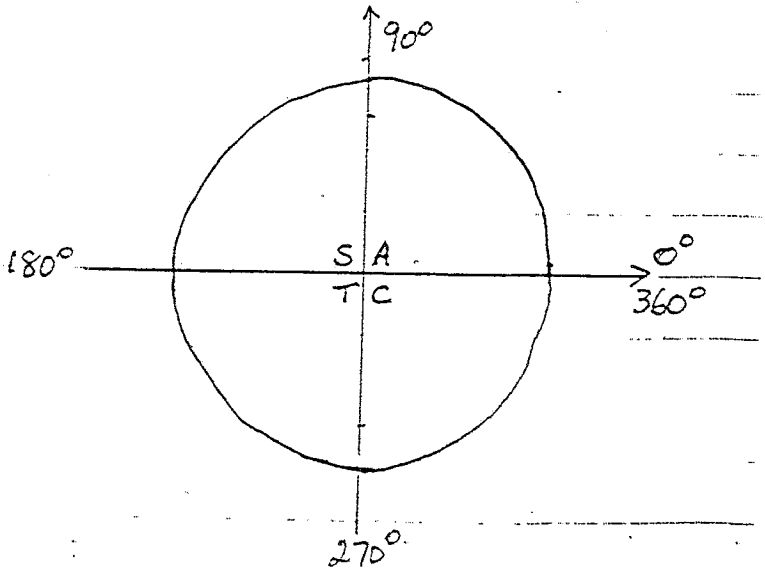
(g) $\cos 30° =$

(h) $\cos 210° =$

(i) $\cos 315° =$

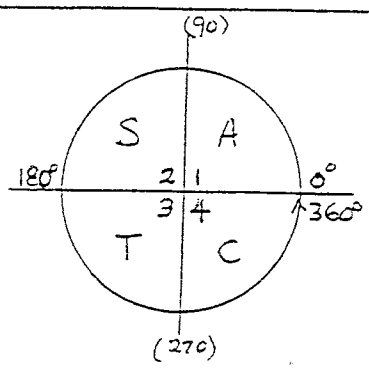
(j) $\tan 180° =$

(k) $\sec^2 120° =$



WORK SHEET (3) - ASTC

Solve for $0° \leq x < 360°$



1 - All values are ⊕ve
2 - Sine only is ⊕ve
3 - Tan only is ⊕ve
4 - Cos only is ⊕ve

① $\sin x = \frac{1}{\sqrt{2}}$

② $\tan x = -\sqrt{3}$

③ $\cos^2 x = \frac{3}{4}$

④ $4\tan x + 3 = 0$

⑤ $\operatorname{cosec} x = -1$

⑥ $\cot x = 2.5$

WORKSHEET (4) – ASTC

① If $\cos\theta = \frac{5}{13}$ and $\sin\theta < 0$
Find the exact value of $\cot\theta$

② Sketch $y = 5\cos\theta$
for $-180° < \theta < +180°$

③ Solve for $0° \leq \theta \leq 360°$

(a) $4\cos^2\theta - 3 = 0$

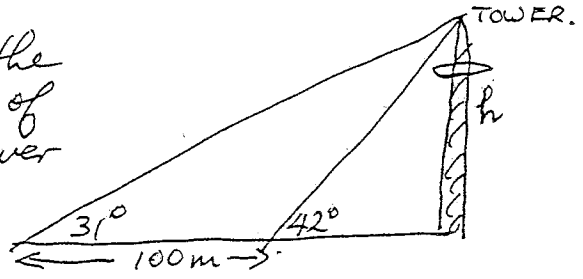
(b) $\sin 3\theta = 0.64$

(c) $2\sin\theta = 3\cos\theta$

(d) $\tan^2\theta - \tan\theta = 6$

(e) $6\cos^2\theta = 4 - \sin\theta$

(f) Find the height of the tower



ANSWERS — Worksheet ASTC

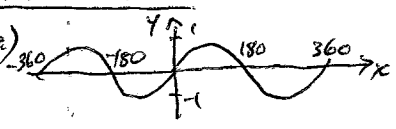
Worksheet 1

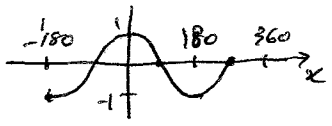
(1) a) 10° b) 40° c) 5° d) 39°

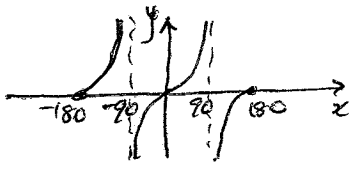
(2) a) Sin 10° b) −Sin 40° c) −Sin 60° d) −tan 10° e) tan 70° f) −Cos 20°
g) Cos 43° h) cos 100° i) Tan 20°

(3) a) θ = 30°58′ or 210°58′ b) θ = 210° or 330° c) θ = 138°35′ or 221°25′

Worksheet 2

(1) a) 

(b) 

c) 

(2) a) 40° b) 20° c) 20° d) 85° e) 80° f) 30°

(3) a) ½ b) ½ c) −½ d) −½ e) −1 f) √3 g) √3/2 h) −√3/2 i) 1/√2 j) 0 k) 4

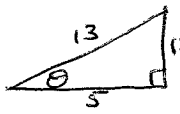
Worksheet 3

(1) x = 45° or 135° (2) x = 120° or 300° (3) x = 30° or 330°

(4) x = 143°8′ or 323°8′ (5) x = 270° (6) θ = 21°48′ or 201°48′

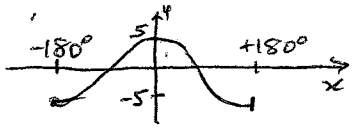
Worksheet 4

(1) (a) If cosθ > 0 & Sinθ < 0 ⇒ θ is in 4th quadrant



← cosθ = 5/13

∴ Cotθ = −5/12

(b) 

(2) (a) Cosθ = ±√3/2 ⟶ θ = 30°, 150°, 210° or 330°

[0 ≤ θ ≤ 360 ⇒ 0 ≤ 3θ ≤ 1080°]

(b) 3θ = 39°48′, 140°12′, 399°48′, 500°12′, 759°48′, 860°12′ ⇒ θ = 13°16′, 46°44′, 133°16′, 166°44′, 253°16′, or 286°44′

(c) Tanθ = 3/2 ⟶ θ = 56°19′ or 236°19′

(d) (Tanθ − 3)(Tanθ + 2) = 0 ⟶ θ = 71°34′, 251°34′, 116°34′ or 296°34′

(e) Replace Cos²θ = (1 − Sin²θ) ⇒ 6Sin²θ − Sinθ − 2 = 0 ⇒ (3Sinθ − 2)(2Sinθ + 1) = 0
∴ Sinθ = 2/3 or Sinθ = −½ ⇒ θ = 41°49′, 138°11′ or 210°, 330°

(f) $\frac{x}{\text{Sin } 138°} = \frac{100}{\text{Sin } 11°} \Rightarrow x = 350.7\text{ m}$ then $\text{Sin } 31° = \frac{h}{x} \Rightarrow h = 180.6\text{ m}$

(x = dist. to top of tower)