Outcome 1 – Solving trig equations

Bronze example

Example...

Solve the equation $7 \sin x° - 1 = 3$ for $0 \leq x \leq 360$.

- Take stuff across!
- Draw a CAST diagram!

$7 \sin x° - 1 = 3$

$7 \sin x° = 4$

$\sin x° = 4 \div 7$

$= 0{\cdot}5714...$

$x° = 34{\cdot}8,\ 145{\cdot}2$

$\sin^{-1}(0{\cdot}5714...) = 34{\cdot}8°$

180 - x	x
✓ S	A ✓
T	C
180 + x	360 - x

Silver example

Example...

Solve the equation $5 \sin x° + 2 = 1$ for $0 \leq x \leq 360$.

- Take stuff across!
- Draw a CAST diagram!

$5 \sin x° + 2 = 1$

$5 \sin x° = -1$

$\sin x° = -1 \div 5$

$= -0{\cdot}2$

$x° = 191{\cdot}5,\ 348{\cdot}5$

$\sin^{-1}(0{\cdot}2) = 11{\cdot}5°$

180 - x	x
S	A
✓ T	C ✓
180 + x	360 - x

Gold example

Examples...

Find the points of intersection between the curve $y = 9 \cos x° + 3$ and the line $y = 8$.

$9 \cos x° + 3 = 8$ **Set them equal**

$9 \cos x° = 5$ **Solve Trig Equation**

$\cos x° = 5 \div 9$

$= 0{\cdot}556$

$\cos^{-1}(0{\cdot}556) = 56{\cdot}3°$

$x° = 56{\cdot}3,\ 303{\cdot}7$

180 - x	x
S	A ✓
T	C ✓
180 + x	360 - x

(56·3, 8) and (303·7, 8) **State coords**

Bronze Questions

Solve the following trig equations...

1. $5 \tan x° - 2 = 0$ $\quad 0 \leq x \leq 360°$
2. $6 \cos x° - 5 = 0$ $\quad 0 \leq x \leq 360°$
3. $8 \sin x° - 3 = 2$ $\quad 0 \leq x \leq 360°$
4. $2 \tan x° + 7 = 10$ $\quad 0 \leq x \leq 360°$
5. $4 \cos x° + 4 = 5$ $\quad 0 \leq x \leq 360°$

Silver Questions

Solve the following trig equations...

1. $5 \sin x° + 3 = 0$ $\quad 0 \leq x \leq 360°$
2. $7 \cos x° + 2 = 0$ $\quad 0 \leq x \leq 360°$
3. $10 \sin x° + 6 = 1$ $\quad 0 \leq x \leq 360°$
4. $2 \tan x° + 3 = 1$ $\quad 0 \leq x \leq 360°$
5. $8 \cos x° + 7 = 2$ $\quad 0 \leq x \leq 360°$

Gold Questions

Find the points of intersection between the following curves and lines...

1. $y = 5 \cos x° - 3$ and $y = 0$
2. $y = 9 \sin x° + 1$ and $y = 5$
3. $y = 6 \cos x° + 2$ and $y = 7$
4. $y = 8 \sin x° + 11$ and $y = 9$
5. $y = 7 \cos x° + 10$ and $y = 4$

Bronze Answers

1. 21·8°, 201·8°
2. 33·6°, 326·4°
3. 38·7°, 141·3°
4. 56·3°, 236·3°
5. 75·5°, 284·5°

Silver Answers

1. 216·9°, 323·1°
2. 106·6°, 253·4°
3. 210°, 330°
4. 135°, 315°
5. 128·7°, 231·3°

Gold Answers

1. (53·1, 0) and (306·9, 0)
2. (26·4, 5) and (153·6, 5)
3. (33·6, 7) and (326·4, 7)
4. (194·5, 9) and (345·5, 9)
5. (149·0, 4) and (211·0, 4)

