

Topic 6 Right-angled triangles (Pre-TT) [42] MARKSCHEME

1.

Sight of tan

M1

NB alternative methods such as sine rule must be used correctly for M1 and must be complete, so if for example Hypotenuse found Pythagoras or further trig must be used.

(BC =) $60 \tan 32$

M1dep

BC = 37.5, 37.49(...)

A1

[3]

2.

| | | | |
|------|--|----|-----------------------------|
| 9.54 | | P1 | $10^2 - 5^2 (=75)$ |
| | | P1 | "75" + $4^2 (=91)$ |
| | | P1 | $\sqrt{(10^2 - 5^2 + 4^2)}$ |
| | | A1 | 9.53 – 9.54 |

3.

(a) $\frac{\sqrt{3}}{2}$

[B1]

(b) Replace $\sin 30^\circ$ by $\frac{1}{2}$ or $\tan 60^\circ$ by $\sqrt{3}$

[B1]

Attempt to rationalise the denominator by multiplying by $\frac{\sqrt{3}}{\sqrt{3}}$

[M1]

$$\frac{4 \sin 30^\circ}{\tan 60^\circ} = \frac{4 \times \frac{1}{2}}{\sqrt{3}} = \frac{2}{\sqrt{3}} = \frac{2\sqrt{3}}{3}$$

[A1]

4.

(a) $\frac{\sqrt{12}}{12}$

M1

Or $\frac{1}{2\sqrt{3}}$

$$= \frac{2\sqrt{3}}{12}$$

$$= \frac{\sqrt{3}}{6}$$

A1

Do not ignore further working

(b) $4\sqrt{2} - 3\sqrt{2}$

B1

Either

$$= \sqrt{2}$$

B1

$$\therefore \sqrt{3}(\sqrt{32} - \sqrt{18}) = \sqrt{3} \times \sqrt{2}$$

$$= \sqrt{6}$$

B1

Or $\sqrt{96} - \sqrt{54}$

$$= 4\sqrt{6} - 3\sqrt{6}$$

B1B1

$$= \sqrt{6}$$

B1

[5]

5.

| | | |
|--|-------|----|
| 6.5 – 2.3 or 4.2 and 5 or 85 seen | M1 | |
| $\sin 5 = \frac{6.5 - 2.3}{AD}$ or $\cos 85 = \frac{6.5 - 2.3}{AD}$ or $\left(\frac{6.5 - 2.3}{\tan 5}\right)^2 + (6.5 - 4.2)^2$ | M1 | oe |
| $\frac{6.5 - 2.3}{\sin 5}$ or $\frac{6.5 - 2.3}{\cos 85}$ or $\sqrt{\left(\frac{6.5 - 2.3}{\tan 5}\right)^2 + (6.5 - 4.2)^2}$ | M1dep | oe |
| [48, 48.2] | A1 | |

6.

| | | |
|--|----------|--|
| $(\sqrt{a} + 2\sqrt{b})(\sqrt{a} - 2\sqrt{b})$ $\sqrt{a} \times \sqrt{a} - 2\sqrt{a}\sqrt{b} +$ $2\sqrt{b}\sqrt{a} - 2\sqrt{b} \times 2\sqrt{b}$ | $a - 4b$ | M1 for expansion of brackets or $\sqrt{4b} = 2\sqrt{b}$ M1 for a or $(-4b)$ A1 cao |
|--|----------|--|

7.

$$\sin 60 = \frac{x}{8} \quad [M1]$$

Replace $\sin 60$ by $\frac{\sqrt{3}}{2}$ so $\frac{\sqrt{3}}{2} = \frac{x}{8}$ [B1]

$$x = 4\sqrt{3} \quad [A1]$$

8.

$$\frac{SQ}{14} = \cos 25^\circ \quad M1$$

$$SQ = 14 \times \cos 25^\circ (= 12.68...) \quad M1$$

$$\frac{\text{theirSQ}}{8.6} = \tan R \quad M1$$

Award this M1 only if SQ has been found by an attempt at trigonometry

$$1.475... \text{ or } 1.48 \quad \text{ft their SQ} \quad A1 \text{ ft}$$

$$55.87 \text{ or } 55.9 \text{ or } 56 \quad A1$$

[5]

9.

$$x = 30 \div 3\sqrt{2}$$

M1

$$(30 \times \sqrt{2}) \div (3 \times 2)$$

M1

Attempt to rationalise denominator

$$5\sqrt{2}$$

A1

[3]

10.

(a) $\sqrt{20} = 2\sqrt{5}$

B1

$$3\sqrt{5}$$

B1

(b) $3\sqrt{5} - 2\sqrt{5}$

M1

$$\frac{\sqrt{5}(1+\sqrt{4})}{\sqrt{5}(\sqrt{9}-\sqrt{4})}$$

$$\frac{\text{their } p\sqrt{5}}{\sqrt{5}}$$

A1ft

3

A1

[5]