

Topic 6 Right-angled triangles (Post-TT) [45] MARKSCHEME

1.

Sight of sine

M1

If sine rule used, must have correct values substituted in

$$x = 32 \times \sin 20$$

M1 dep

Complete trig method scores M2

10.9(...) or 11

A1

[3]

2.

$$2\sqrt{3}\sqrt{3} (+) 2\sqrt{3}\sqrt{8}$$

M1

$$2\sqrt{9} (+) 2\sqrt{3}\sqrt{8} \text{ or}$$

$$2\sqrt{9} (+) 2\sqrt{24} \text{ or}$$

$$2\sqrt{9} (+) 2\sqrt{3} \times 2\sqrt{2}$$

$$6 (+) 2\sqrt{24}$$

A1

$$6 (+) 2\sqrt{3} \times 2\sqrt{2}$$

$$6 + 4\sqrt{6}$$

SC1 6 or 4√6 seen

A1

[3]

3.

No with reasoning	<p>M1 Derive $AC=9$ cm and identify as hypotenuse</p> <p>M1 $4^2 + 7^2$</p> <p>A1 for using eg $AC = \sqrt{4^2 + 7^2}$ or 65 and 81</p> <p>C1 for concluding explanation that ABC is not a right-angled triangle with evidence.</p>
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4.

(a) $\frac{\sqrt{2}}{2}$ or $\frac{1}{\sqrt{2}}$

[B1]

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

[B1]

$$5 \times \sin 60^\circ \times \tan 30^\circ = 5 \times \frac{\sqrt{3}}{2} \times \frac{\sqrt{3}}{3}$$

Attempt to simplify

[M1]

$$\frac{5}{2} \text{ or } 2.5$$

[A1]

5.

Sight of sine

M1

If sine rule used then must have correct values substituted in

$$x = 32 \times \sin 20$$

DM1

$$= 10.9(\dots) \text{ or } 11$$

A1

[3]

6.

(a) $\frac{15}{\sqrt{5}} = \frac{15\sqrt{5}}{\sqrt{5}\sqrt{5}}$ M1

$= \frac{15\sqrt{5}}{5} (=3\sqrt{5})$ A1

Accept $\sqrt{45}$

(b) $(\sqrt{3} + \sqrt{12})^2 = (\sqrt{3} + 2\sqrt{3})^2$ M1

Accept
 $\sqrt{3} \times \sqrt{3} + \sqrt{30} + \sqrt{36} + \sqrt{12} \times \sqrt{12}$

$= (3\sqrt{3})^2$
 $= 27$ A1

[4]

7.

(a) $10^2 - 5^2 = QR^2$ M1

$QR = \sqrt{75}$ M1dep

8.66(0...) or $5\sqrt{3}$ or 8.7 A1
9 with working

(b) $\cos P = \frac{5}{10}$

$\sin P = \text{their } \sqrt{\frac{75}{10}}$

$\tan P = \text{their } \sqrt{\frac{75}{5}}$ M2

Finding R then subtract from 90

60 A1

[6]

8.

(a) Sight of tan unless alternative method used M1

\tan^{-1} (5.59/1.5) DM1

$90^\circ - \tan^{-1}(1.5/5.59), 1.5\tan 70 \text{ and } 1.5\tan 80$

74.(98) or 75° so safe A1

4.1(2) and 8.5(1)

(b) Sight of cos M1

$4 \times \cos 80$ DM1

0.69 A1

0.7 with working

[6]

9.

$$\tan 45 = \frac{x}{15}$$

[M1]

Replace $\tan 45$ by 1 so $1 = \frac{x}{15}$

[B1]

$$x = 15$$

[A1]

10.

(a) $BD/15 = 2/3$
 $BD = 10$

M1

A1

Or equivalent eg. $BD = 2/3 \times 15$

(b) Correct use of Pythagoras
 $BC = 8$
 $\sin y = 8/10$

M1

A1 ft.

A1 ft.

f.t. with their BD iff $BD > 6$ for this M mark

[5]

11.

$$(\sqrt{10} - 2)(\sqrt{10} + 2)$$

M1

$$6$$

A1

(length \Rightarrow) $6 \div \sqrt{3}$

M1

oe

$$2\sqrt{3}$$

A1

[4]