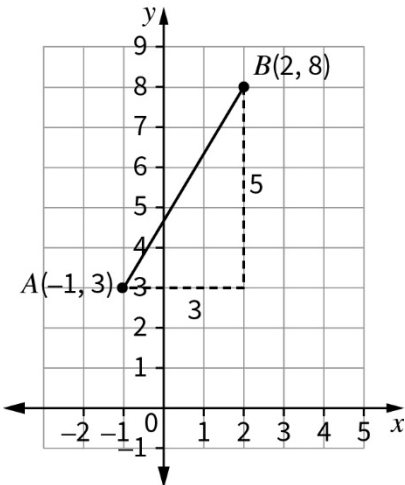


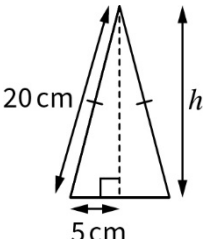
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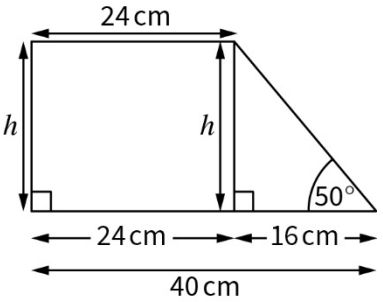
Chapter 24 Pythagoras and trigonometry

Question	Answer	Extra information	Marks
24.1	Triangle D ($7^2 + 24^2 = 25^2$)	Correctly checking if $a^2 + b^2 = c^2$ for at least one of the triangles Correct answer	1 1
24.2 (a)	Right angled triangle: $6^2 + 8^2 = x^2$ $x^2 = 100$ $x = 10$ cm	Squaring and adding Taking the square root of the answer Correct answer	1 1 1
24.2 (b)	Right angled triangle: $12^2 + y^2 = 13^2$ $144 + y^2 = 169$ $y^2 = 25$ $y = 5$ cm	Squaring and subtracting Taking the square root of the answer Correct answer	1 1 1
24.3 (a)	Right angled triangle: $11^2 + 15^2 = x^2$ $x^2 = 346$ $x = \sqrt{346}$ $x = 18.6$ cm (1 dp)	Squaring and adding Taking the square root of the answer Correct answer	1 1 1

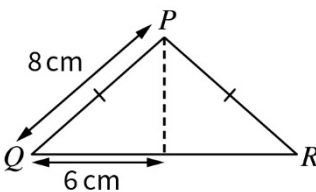
Question	Answer	Extra information	Marks
24.3 (b)	Right angled triangle: $29^2 + y^2 = 34^2$ $841 + y^2 = 1156$ $y^2 = 315$ $y = \sqrt{315}$ $y = 17.7 \text{ cm (1dp)}$	Squaring and subtracting Taking the square root of the answer Correct answer	1 1 1

Question	Answer	Extra information	Marks
24.4	 <p>From the diagram:</p> $(AB)^2 = 5^2 + 3^2 = 34$ $AB = 5.83 \text{ cm (3sf)}$	<p>Identifying at least one of 3 and 5 as sides of a right-angled triangle</p> <p>Squaring and adding</p> <p>Taking the square root of the answer</p> <p>Correct answer</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p>

Question	Answer	Extra information	Marks
24.5	 <p>From the diagram:</p> $h^2 = 20^2 - 5^2 = 375$ $h = \sqrt{375} = 19.4 \text{ cm (1 dp)}$	<p>Splitting into two right-angled triangles with base 5 cm</p> <p>Squaring and subtracting</p> <p>Correct answer to 1 dp</p>	<p>1</p> <p>1</p> <p>1</p>
24.6 (a)	$x = 16 \cos 35^\circ = 13.11 \text{ cm (2 dp)}$	<p>Correct calculation</p> <p>Correct answer to 2 dp</p>	<p>1</p> <p>1</p>
24.6 (b)	$y = 42 \tan 27^\circ = 21.40 \text{ cm (2 dp)}$	<p>Correct calculation</p> <p>Correct answer to 2 dp</p>	<p>1</p> <p>1</p>
24.6 (c)	$z = \frac{14}{\sin 67^\circ} = 15.21 \text{ cm (2 dp)}$	<p>Correct calculation</p> <p>Correct answer to 2 dp</p>	<p>1</p> <p>1</p>
24.6 (d)	$p = 6 \sin 32^\circ = 3.18 \text{ cm (2 dp)}$	<p>Correct calculation</p> <p>Correct answer to 2 dp</p>	<p>1</p> <p>1</p>

Question	Answer	Extra information	Marks
24.6 (e)	$q = \frac{10}{\tan 47^\circ} = 9.33 \text{ cm (2 dp)}$	Correct calculation Correct answer to 2 dp	1 1
24.6 (f)	$r = \frac{8}{\cos 62^\circ} = 17.04 \text{ cm (2 dp)}$	Correct calculation Correct answer to 2 dp	1 1
24.7	 <p>Base of triangle = $40 - 24 = 16 \text{ cm}$ $h = 16 \tan 50^\circ = 19.1 \text{ cm (3 sf)}$</p>	$40 - 24$ $16 \tan 50^\circ$ Correct answer to 3 sf	1 1 1
24.8	Let x = distance from Taylor to the helicopter $\sin 26^\circ = \frac{1000}{x}$ $x = \frac{1000}{\sin 26^\circ} = 2281.172\dots$ $x = 2300 \text{ m, to 2 sf}$	$\frac{1000}{\sin 26^\circ}$ Correct answer to 2 sf	1 1

Question	Answer	Extra information	Marks
24.9	$\sin x = \frac{9}{15} = \frac{3}{5}$	$\frac{9}{15}$ or $\frac{3}{5}$, either is fine	1
24.10 (a)	$\sin x = \frac{4}{7}$ $x = \sin^{-1}\left(\frac{4}{7}\right) = 34.8^\circ$	Correct calculation Correct answer to 1 dp	1 1
24.10 (b)	$\tan x = \frac{10}{11}$ $x = \tan^{-1}\left(\frac{10}{11}\right) = 42.3^\circ$	Correct calculation Correct answer to 1 dp	1 1
24.10 (c)	$\cos x = \frac{13}{20}$ $x = \cos^{-1}\left(\frac{13}{20}\right) = 49.5^\circ$	Correct calculation Correct answer to 1 dp	1 1

Question	Answer	Extra information	Marks
24.11	 <p> $QR = 12 \div 2 = 6$ $\cos PQR = \frac{6}{8}$ $PQR = \cos^{-1}\left(\frac{6}{8}\right) = 41.4^\circ$ </p>	$12 \div 2$ $\cos PQR = \frac{6}{8}$ Attempting to use \cos^{-1} to find the angle Correct answer to 1 dp	1 1 1 1
24.12	1		1
24.13 (a)	$x = 4 \sin 30^\circ = 2 \text{ cm}$	$4 \sin 30^\circ$ $\sin 30^\circ = 0.5$ Correct final answer	1 1 1
24.13 (b)	$x = 1 \times \tan 45^\circ = 1 \text{ cm}$	$1 \times \tan 45^\circ$ $\tan 45^\circ = 1$ Correct final answer	1 1 1

Question	Answer	Extra information	Marks
24.13 (c)	$x = \frac{6}{\cos 60^\circ} = 12 \text{ cm}$	$6 \div \cos 60^\circ$ $\cos 60^\circ = 0.5$ Correct final answer	1 1 1
24.14 (a)	$\frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$	Either $\frac{1}{\sqrt{2}}$ or $\frac{\sqrt{2}}{2}$	1
24.14 (b)	$1 + 0.5 = 1.5$	1 or 0.5 Correct answer	1 1
24.14 (c)	$\frac{\sqrt{3}}{2}$		1
24.14 (d)	$\sqrt{3} - 0 = \sqrt{3}$	$\sqrt{3}$ or 0 Correct answer	1 1

Question	Answer	Extra information	Marks
24.15	Convert all units to cm Volume of left prism: $\frac{1}{2} \times 1.8 \times 1.6 \times 11 = 15.84$ Volume of right prism: $\frac{1}{2} \times 4 \times 2.4 \times h = 15.84$ $h = \frac{15.84 \times 2}{4 \times 2.4} = 3.3 \text{ cm}$	$\frac{1}{2} \times 1.8 \times 1.6 \times 11$ or $\frac{1}{2} \times 4 \times 2.4 \times h$ $h = 3.3$	1 1 1 1
24.16	$2x + x + 60 = 180$ (co-interior angles) $3x = 120$ $x = 40^\circ$	Forms a correct equation A correct algebraic step Correct answer	1 1 1