# O Level E Maths Tutorial 13: Pythagoras' theorem and trigonometry

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Syllabus :
• use of Pythagoras' theorem

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1. Find the values of x and y in these figures.

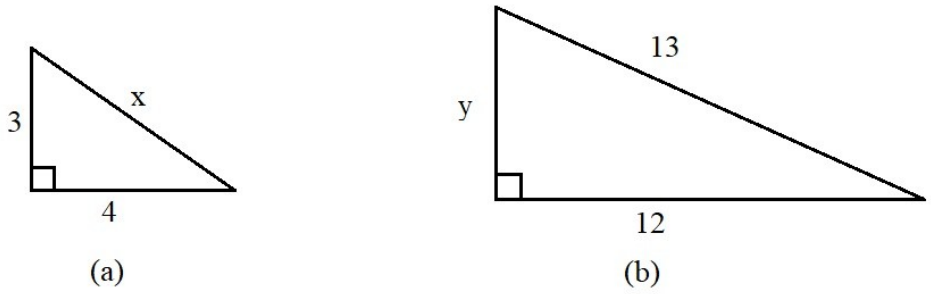


Figure 13-1

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• determining whether a triangle is right-angled given the lengths of three sides

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2. Determine whether these triangles are right-angled.

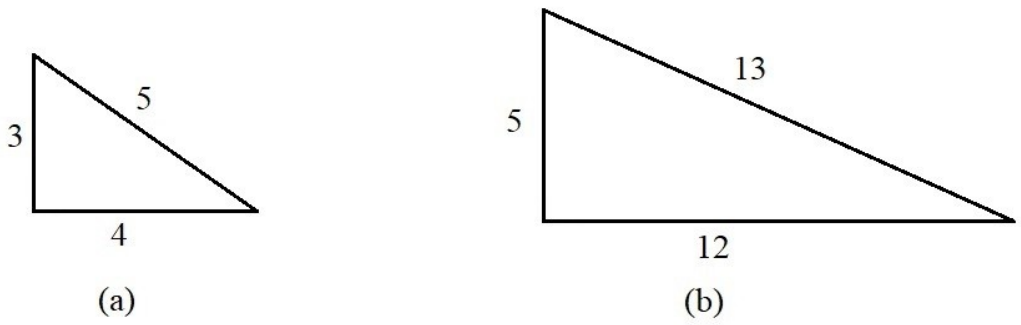


Figure 13-2

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• use of trigonometric ratios (sine, cosine and tangent) of acute angles to calculate unknown sides and angles in right-angled triangles

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3. Find the sides x, y and z.

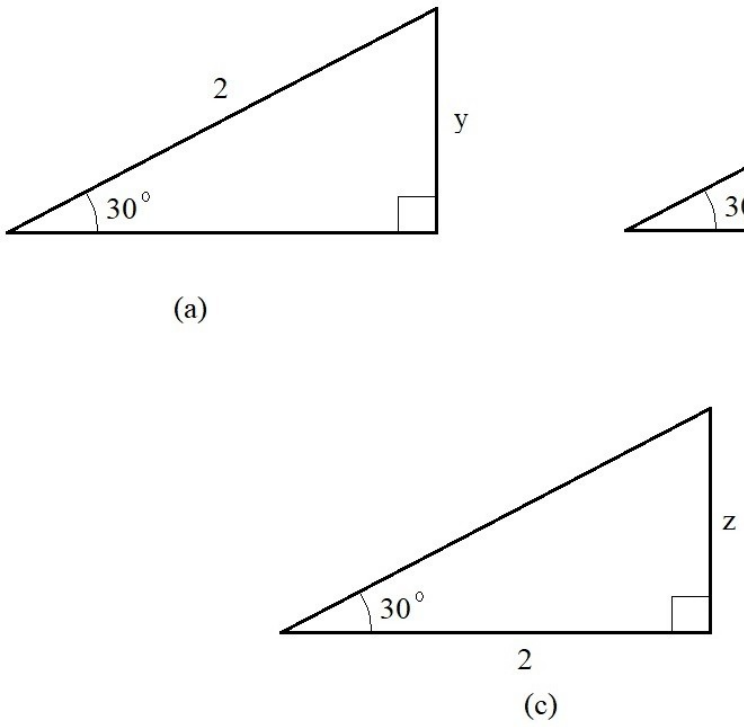


Figure 13-3

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• extending sine and cosine to obtuse angles

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4.

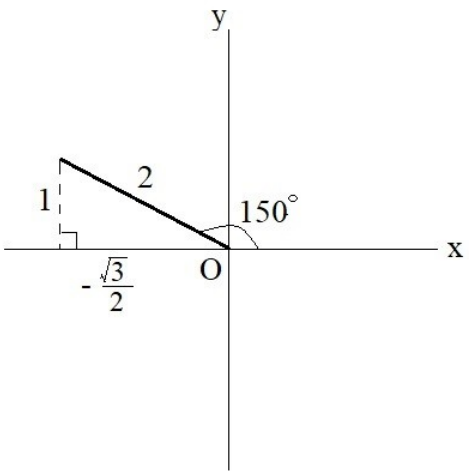


Figure 13-4

Find the values of

(i) sin 150°
(ii) cos 150°
(iii) tan 150°

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• use of the formula ½ *ab* sin C for the area of a triangle

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5. Find the area of this triangle.

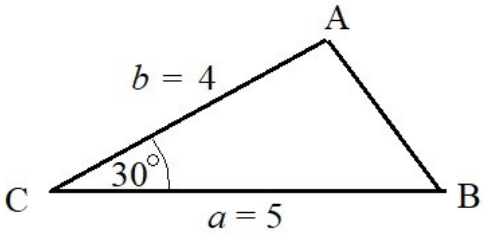


Figure 13-5

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• use of sine rule and cosine rule for any triangle

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6. Given that $a$ is 10 cm. Use the sine rule to find $b$.

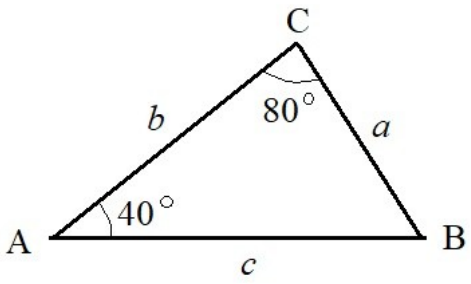


Figure 13-6

Sine rule: $\frac{a}{\sin A}=\frac{b}{\sin B}=\frac{c}{\sin C}$

7. Use the cosine rule to find the length $a$.

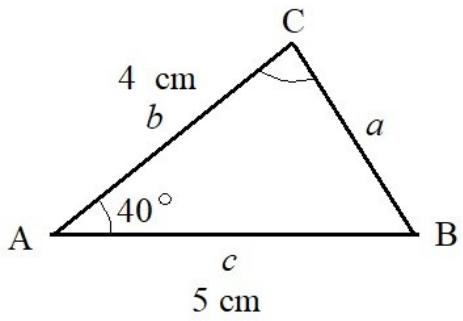


Figure 13-7

Cosine rule: $a^2=b^2+c^2-2bc\cos A$

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• problems in two and three dimensions including those involving angles of elevation and depression and bearings

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8. This figure shows a solid sitting on a table.

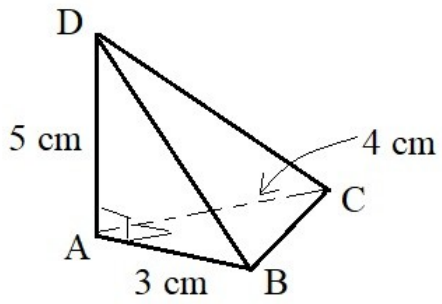


Figure 13-8

(i) Find the angle of elevation of D from B.

(ii) Find the angle of depression of C from D.

(iii) The direction from B to C points north. Find the bearing of the direction from B to A.