N5 Test your knowledge

Printable Checklist

Click on a topic below to test your knowledge.

1. Scientific Notation
2. Fractions
3. Percentages
4. Expanding Brackets
5. Factorising
6. Straight Line
7. Surds & Indices
8. Arcs & Sectors
9. Volumes
10. Complete the Sqaure
11. Pythagoras: Converse Circles 3D
12. Angle Properties
13. Algebraic Fractions
14. Equations & Inequations

Topics 15 - 30

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N5 Test your knowledge

Printable Checklist

Click on a topic below to test your knowledge.

15. Change the Subject
16. Simultaneous Equations
17. Functions
18. Similarity
19. Trig Area
20. Trig Rules
21. Trig Bearings
22. Repeated Trig Rules
23. Statistics
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28. Quadratic Graphs 2
29. Trig Equations & Identities
30. Trig Graphs

Topics 1 - 14

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N5 Scientific Notation

1. A grain of sand weighs 6.45×10^{-5} kilograms.
   A bag holds 3.9×10^{5} grains of sand.

   Calculate the weight of the sand in the bag.

2. There are approximately 7.9×10^{9} people on Earth.
   Roughly 8% of people have blue eyes.

   Estimate the number of people on Earth who have blue eyes. Write your answer in scientific notation.

Menu

ANSWERS

N5 Fractions

1. Calculate: $9\frac{1}{2} \div 3\frac{3}{8}$

2. Calculate: $3\frac{1}{2} + 2\frac{2}{9}$

3. Calculate: $5\frac{1}{4} - 2\frac{4}{5}$

4. Calculate: $2\frac{1}{3} \times 1\frac{4}{5}$

5. Calculate: $\frac{2}{5}(1\frac{3}{5} + 2\frac{1}{2})$

6. Calculate: $\frac{6}{7} of\ 2\frac{1}{4} + 3\frac{1}{2}$

ANSWERS

N5 Percentages

1. A group of friends go out for dinner.
   The total of their bill with a 8% tip comes to £229.50
   Find the cost of their bill before the tip was added.

2. Laura buys a house in 2019 valued at £182,000.
   The value of the cottage appreciated by 4.3% per annum.
   What was the value of the house in 2022 correct to 3 s.f.

3. A car depreciates by 2.5% p.a. How much will it be worth in 3 years time if it cost £14895 new.

4. A TV costs £320 in the sale with 20% off.
   How much did the TV cost before the sale?

ANSWERS

Menu

N5 Expanding Brackets

1. Expand & simplify: $(2x + 1)(3x - 5)$

2. Expand & simplify : $(3x + 4)(x^2 - 2x + 6)$

3. Expand & simplify : $4(5x + 3) - 3(2x + 9)$

Menu

ANSWERS

N5 Factorising

1. Factorise fully: $9m^2 + 33mn$

2. Factorise fully : $9p^2 - 100$

3. Factorise fully : $x^2 + 4x - 21$

4. Factorise fully : $3x^2 + 20x + 12$

5. Factorise fully: $5x^2 - 45$

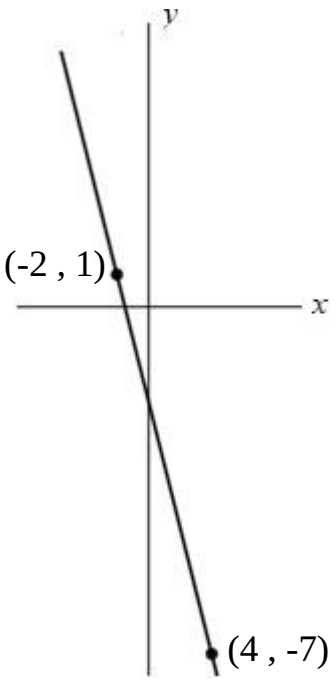
Menu

ANSWERS

N5 Straight Line

1. Find the equation of the line joining the points (-3 , 2) & (1 , 6)

2. Find the equation of the line shown in the diagram:



3. State the gradient and y-intercept of $3x - 2y + 6 = 0$

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ANSWERS

N5 Surds

1. Simplify: $\sqrt{75} + 2\sqrt{3} - \sqrt{27}$

2. Rationalise the denominator: $\frac{5\sqrt{2}}{3\sqrt{5}}$

Menu

ANSWERS

N5 Indices

1. Simplify: $\frac{2c^7 \times 9c^2}{12c^3}$

2. Expand & simplify: $(5y^3)^2$

3. Evaluate: $32^{\frac{3}{5}}$

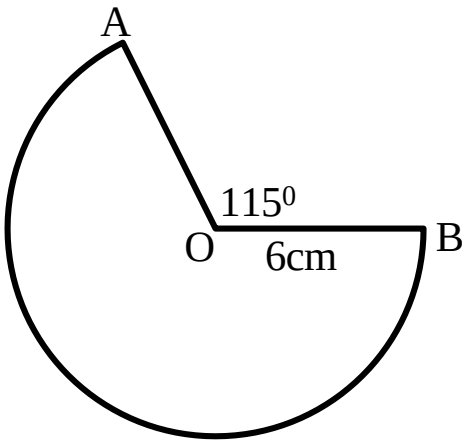
4. Expand & simplify: $a^{\frac{1}{2}}\left(a^{\frac{5}{2}} + a^{-\frac{1}{2}}\right)$

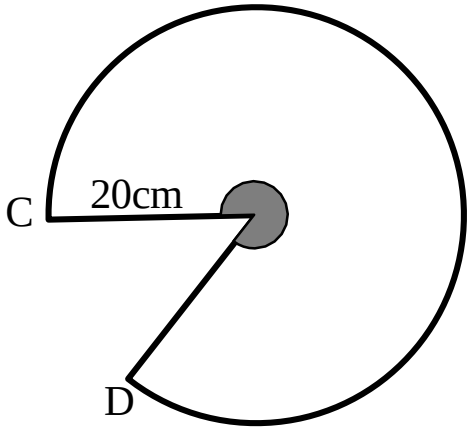
Menu

ANSWERS

N5 Arc Length

1. Calculate the length of the major arc *AB*



2. 

The length of major arc *CD* is 108cm.
The radius of the sector is 20cm.
Find the size of the shaded angle.

3. Find the Radius when the arc length is 20.4mm & the angle is 58°.

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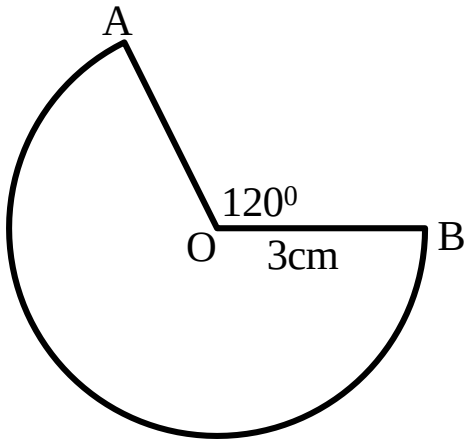
ANSWERS

N5 Sector Area

1. Calculate the area of the major sector *AOB*. Use $\pi = 3.14$.



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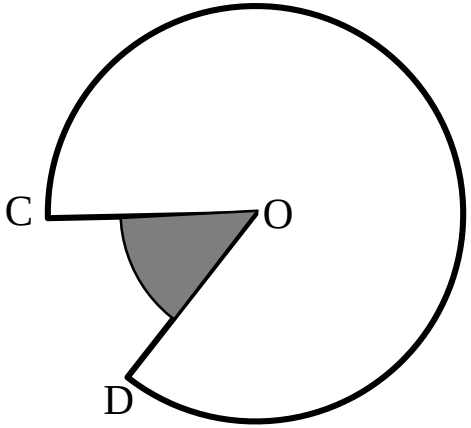

The area of major sector *COD* is 218cm^2. The diameter of the sector is 18cm.
Find the size of the shaded angle.

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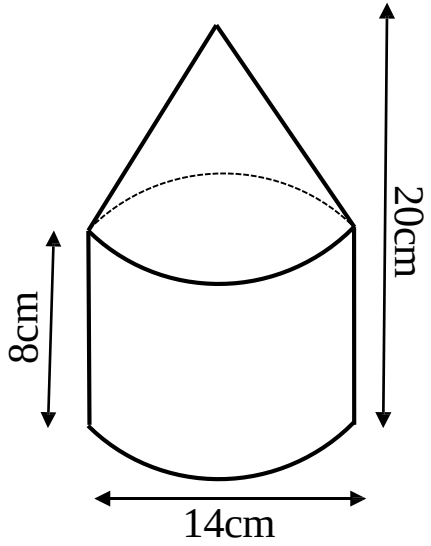
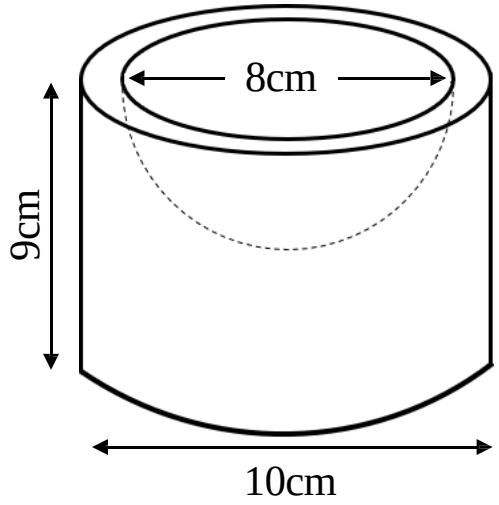
ANSWERS

N5 Volumes

1. An object is made of a cone sitting on top of a cylinder, as shown. Find the total volume of this object to 3 significant figures.



2. An object is made of a cylinder with a hemispherical indent. Find the total volume of this object to 3 significant figures.



ANSWERS

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N5 Complete the Square

1. Express $x^2 + 12x + 18$ in the form $(x + p)^2 + q$

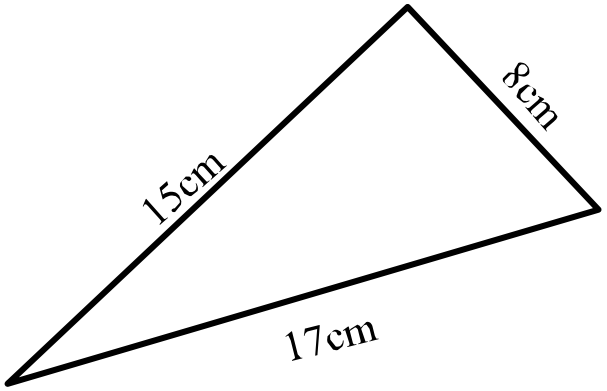
2. Express $x^2 - 8x - 3$ in the form $(x + p)^2 + q$

Menu

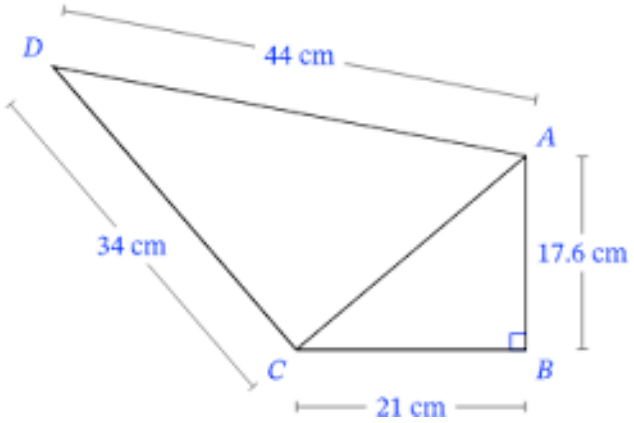
ANSWERS

N5 Pythagoras - Converse

1. Determine whether or not this triangle is right angled



2. Is triangle *ACD* right angled?



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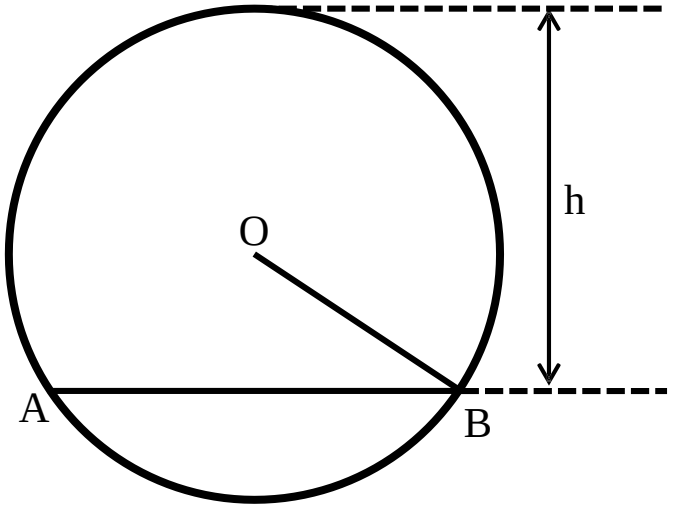
ANSWERS

N5 Pythagoras - Circles

1. In the diagram opposite,
radius OB = 9cm & length AB = 14cm.
Calculate the height, h, correct to 2d.p.



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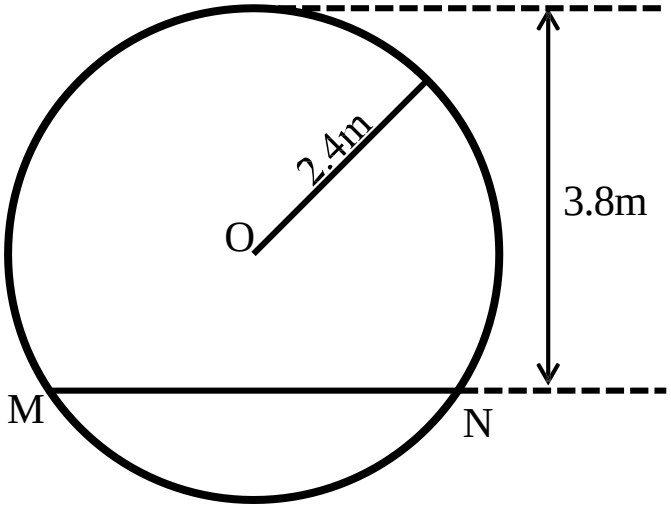

In the diagram opposite, the radius = 2.4m & the height = 3.8m.
Calculate the length of MN correct to 1d.p.

ANSWERS

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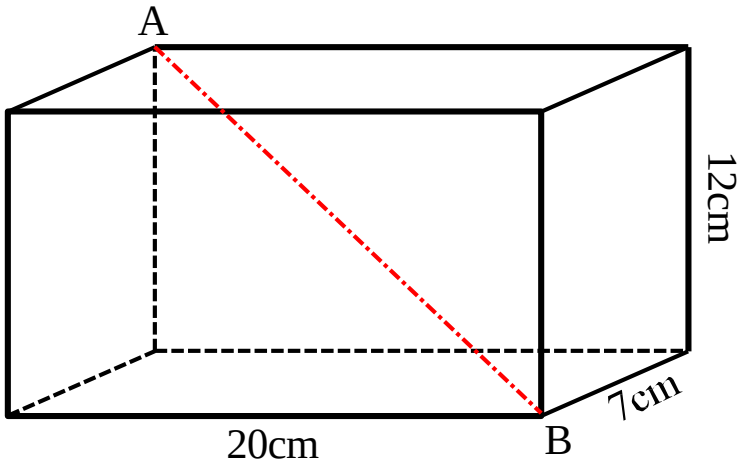
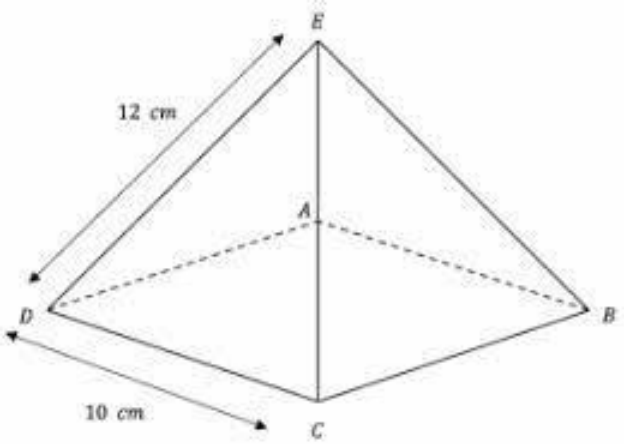
N5 Pythagoras – 3D

1. Calculate the length of the space diagonal correct to 2.d.p.



2.



Calculate the height of this square based pyramid correct to 2d.p.

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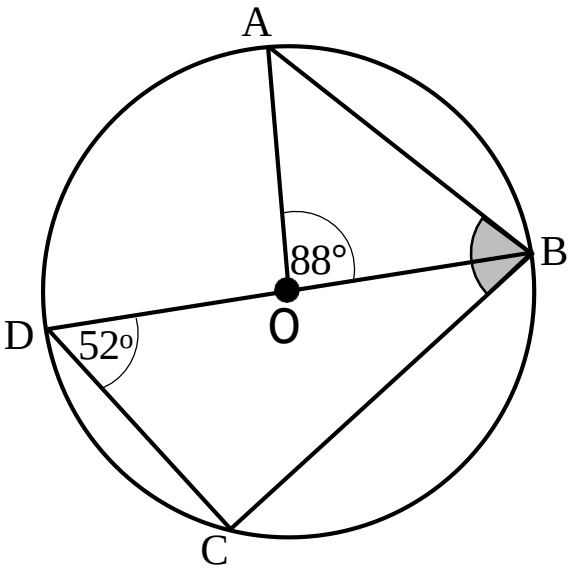
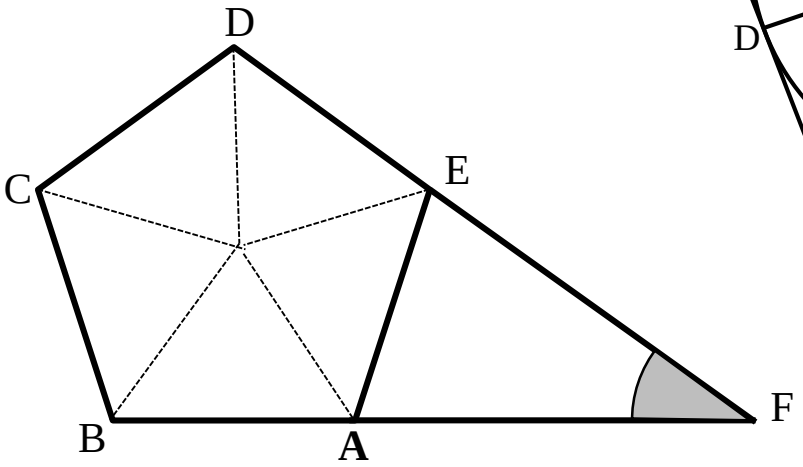
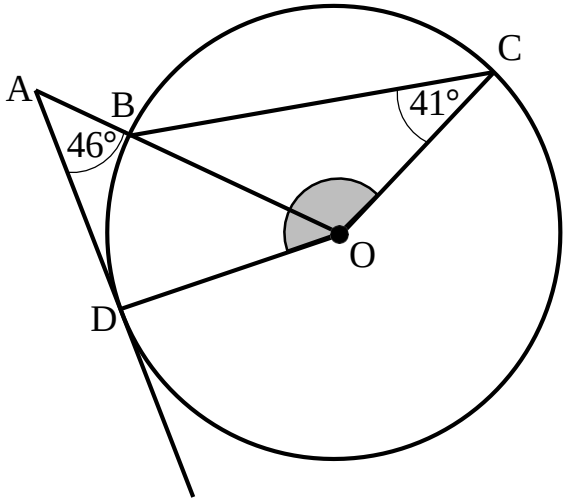
ANSWERS

N5 Angle Properties

1. Calculate the shaded angle in each shape below:







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ANSWERS

N5 Algebraic Fractions

1. Simplify: $\frac{8}{3x} \div \frac{14}{9x^2}$

2. Simplify: $\frac{6m^2+21m}{6m^2+19m-7}$

3. Write as a single fraction: $\frac{5}{x+2} - \frac{3}{x+5}$

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ANSWERS

N5 In/Equations

1. Solve: $15 - 3(2x - 4) < 25 + 6x$

2. Solve: $\frac{2x}{3} - 2 = \frac{x-4}{4}$

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ANSWERS

N5 Change the Subject

1. Change the subject to n: $a = \frac{3n^2 + 5}{p}$

2. Change the subject to d: $c = \frac{1}{2}\sqrt{d} - 4be$

Menu

ANSWERS

N5 Simultaneous Equ's

1. Solve: $2x + 4y = -2$
   $5x - 3y = 21$

2. The cost of 10 textbooks and 8 boxes of pens is £119.50
   a) Form an equation to represent this information

   The cost of 4 textbooks and 10 boxes of pens is £73.30
   b) Form an equation to represent this information

   c) Find the cost of one textbook and of one box of pens.

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ANSWERS

N5 Functions

1. Function f is defined as $f(x) = 3x^2 - 7$

   a) Evaluate $f(-5)$

   b) Find the value of a if $f(a) = 41$

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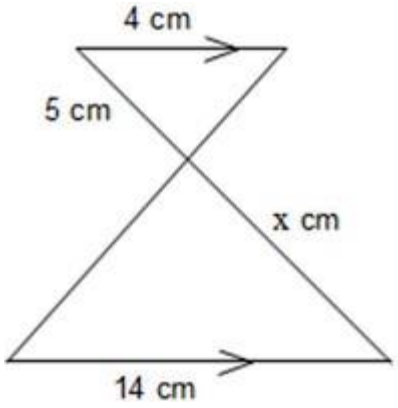
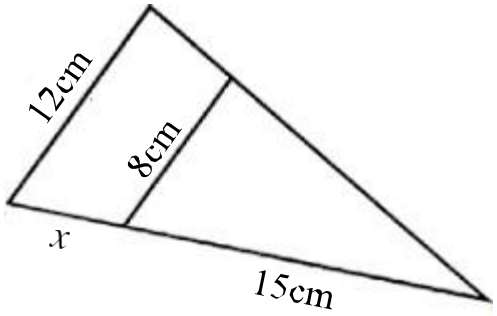
ANSWERS

N5 Similarity

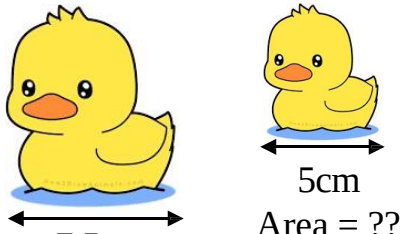
1. Find *x*: (a)



(b)

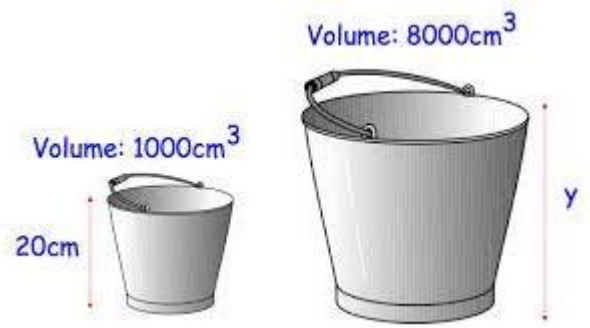


2. Find the Area of the small duck:



Area = 36cm^2

3.



Find the height, *y*, of the larger bucket.

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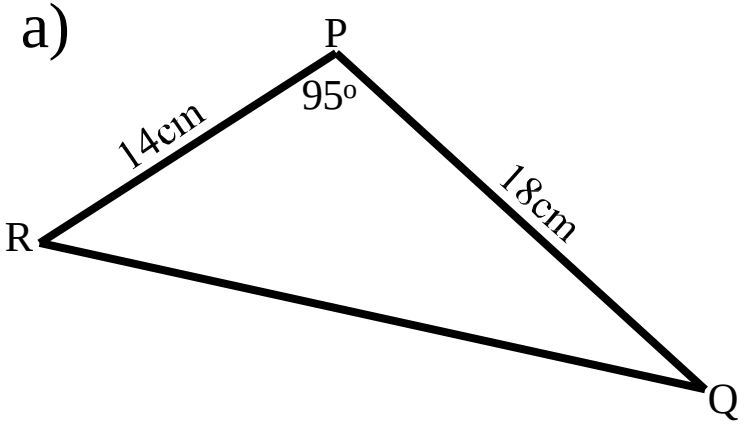
ANSWERS

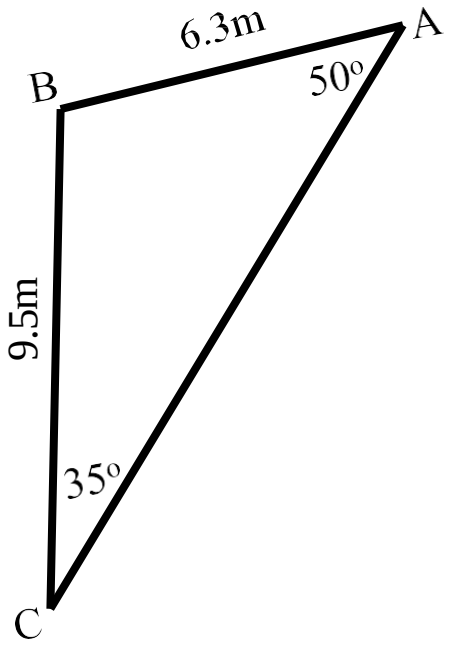
N5 Trig Area

1. Find the areas of each shape below:

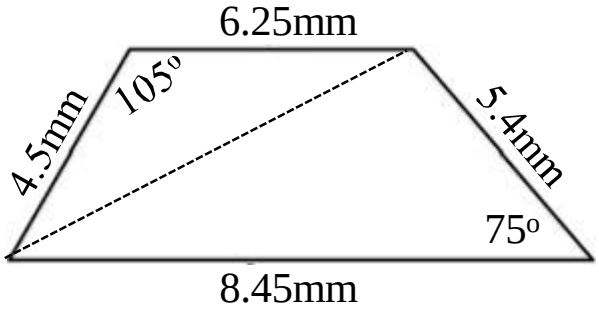
a)



(b)



(c)



ANSWERS

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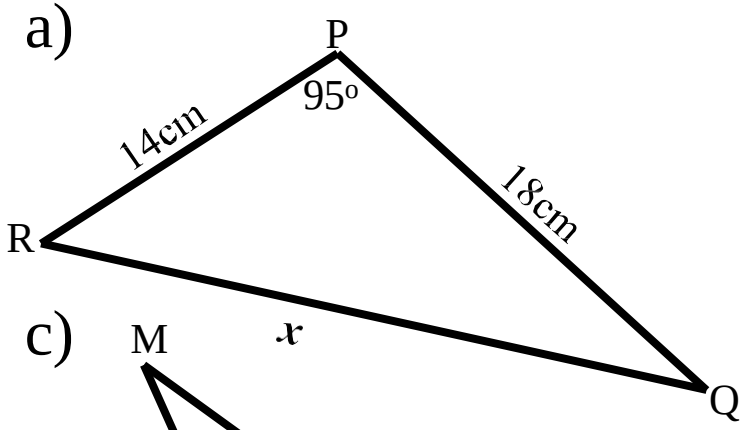
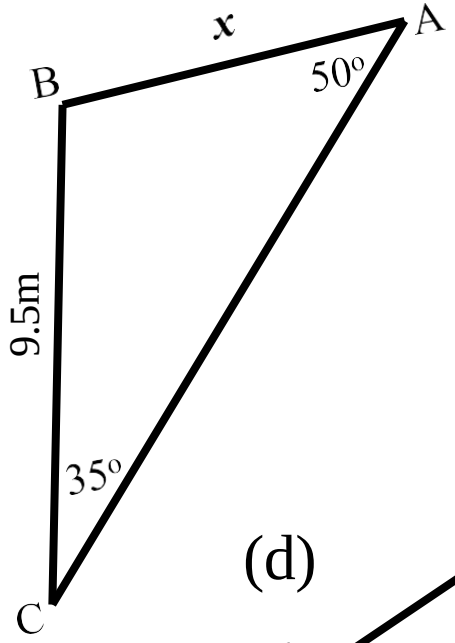
N5 Trig Rules

1. Find x in each shape below:

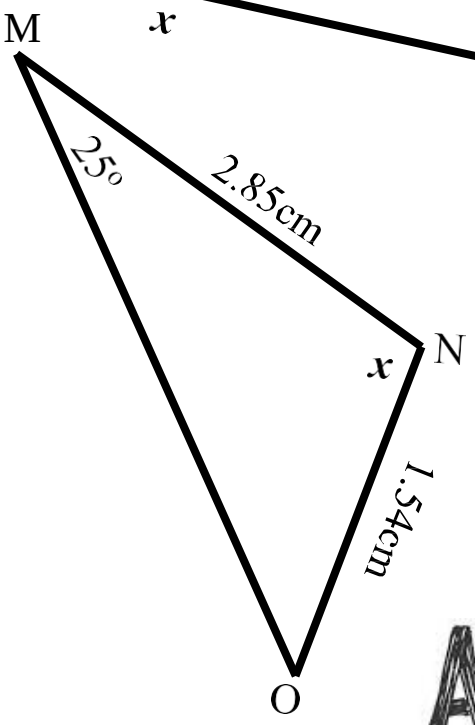
a)



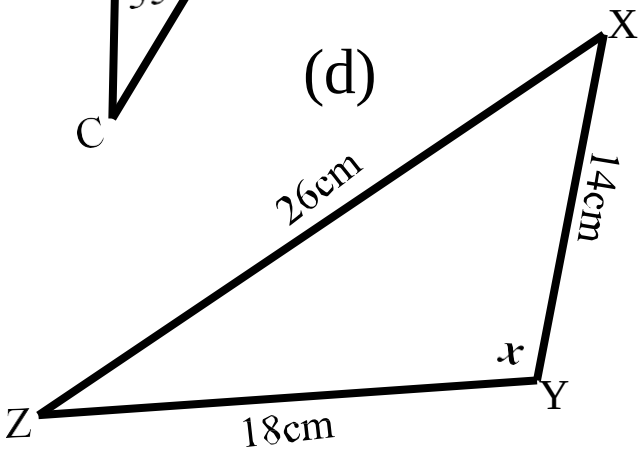
(b)



c)



(d)



ANSWERS

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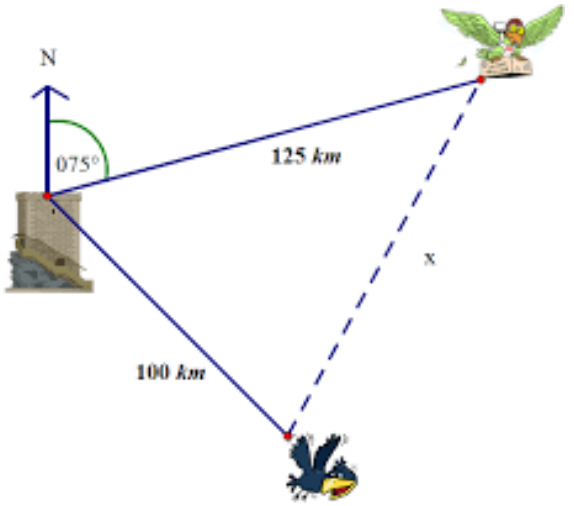
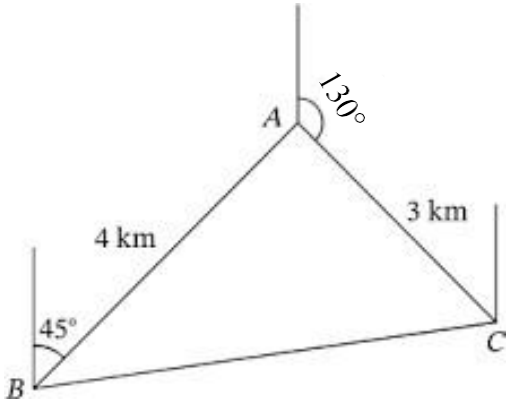
N5 Trig Bearings

1. A parrot is released from a bird sanctuary and flies on a bearing of 075° for 125km. A crow is also released and flies on a bearing of 140° for 100km. How far apart are the 2 birds?



2. a) Find the length of BC

   b) Find the bearing from B to C to the nearest degree.



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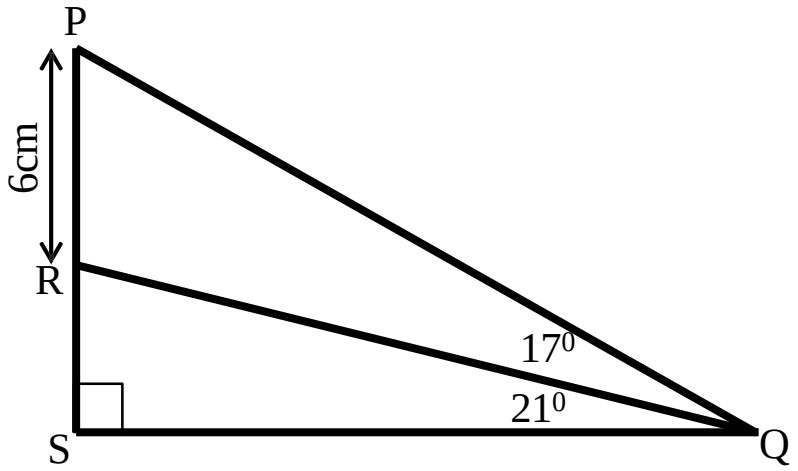
ANSWERS

N5 Repeated Trig Rules

1. Find the Length of *SR*.



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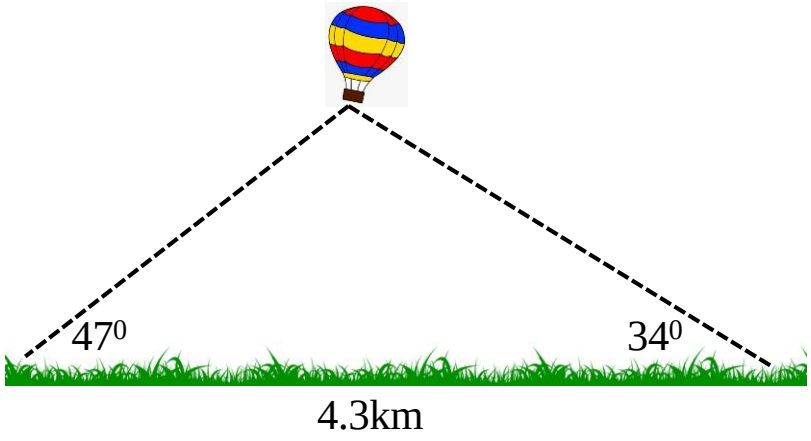

A hot air balloon is spotted in the air from 2 positions 4.3km apart. The angles of elevation are 47° & 34°. How high is the balloon?

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ANSWERS

N5 Statistics

1. Six people on a train are asked their ages in a survey.

   27 32 25 32 30 28

   a) Find the mean and standard deviation of this data set:

   Six people on a bus are asked their ages and it is found that the standard deviation is 3.6 and the mean age is 26

   b) Write 2 statements to compare these data sets.

2. Calculate the Median and SIQR for the following data set:

   96 54 67 74 85 66 90

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ANSWERS

N5 Vectors Components

$$\underline{a} = \begin{pmatrix} 2 \\ -5 \end{pmatrix} \quad \underline{b} = \begin{pmatrix} -4 \\ 3 \end{pmatrix} \quad \underline{u} = \begin{pmatrix} -2 \\ 4 \\ 2 \end{pmatrix} \quad \underline{v} = \begin{pmatrix} 5 \\ 7 \\ -1 \end{pmatrix}$$

1. Find the components of: a) $2\underline{a} + \underline{b}$ (b) $3\underline{u} - 2\underline{v}$ (c) $\frac{1}{2}\underline{u}$

2. Find: a) $|\underline{a} - 2\underline{b}|$  (b) $|2\underline{u} + 3\underline{v}|$ correct to 2d.p.

3. Find the resultant vector (force) $\frac{3}{2}\underline{u} + \underline{v}$

4. Find the components of vector $\underline{\boldsymbol{x}}$ when $2\underline{v} + \underline{x} = \begin{pmatrix} 7 \\ 15 \\ -5 \end{pmatrix}$

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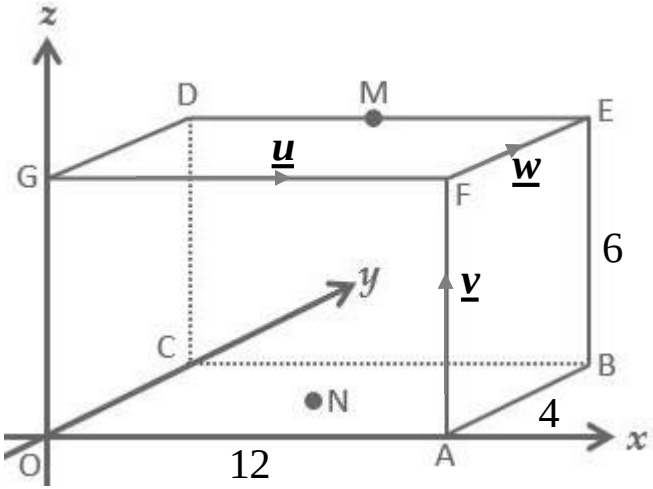
ANSWERS

N5 3D Coordinates

In the diagram: $\overrightarrow{OA} = 12$, $\overrightarrow{AB} = 4$ & $\overrightarrow{BE} = 6$

$\overrightarrow{GF} = \underline{u}$ $\overrightarrow{AF} = \underline{v}$ $\overrightarrow{FE} = \underline{w}$



1. State the coordinates of: A, B, D, E & F

2. M is the midpoint of DE & N is the middle of the cuboids base. State the coordinates of M & N.

3. Express the following in terms of $\underline{u}$, $\underline{v}$ & $\underline{v}$.
   a) $\overrightarrow{DA}$ (b) $\overrightarrow{AM}$ (c) $\overrightarrow{EN}$ (d) $\overrightarrow{NM}$

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ANSWERS

N5 Solving Quadratics

1. Solve: a) $x^2 + 6x + 5 = 0$

   b) $2x^2 + x - 6 = 0$

2. Determine the nature of the roots of: a) $x^2 - 4x + 4 = 0$

   b) $x^2 - 2x + 6 = 0$

3. Solve correct to 2d.p. $2x^2 + 5x - 1 = 0$

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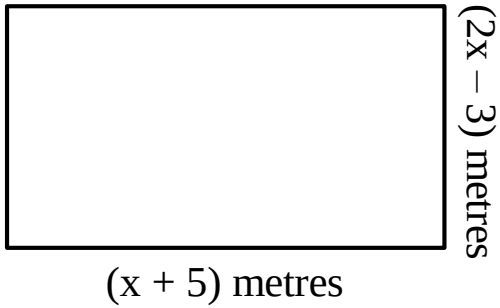
ANSWERS

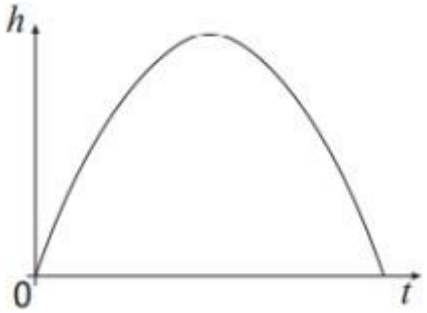
N5 Quadratic Problems

1. The rectangle has length (x + 5) metres & breadth of (2x – 3) metres.



   a) Show that the area of the rectangle is given by $A = 2x^2 + 7x - 15$
   b) The area of the rectangle is $24m^2$. Calculate, the length and breadth of the rectangle.

2. The path of a firework shot into the air at a display is shown here. The height, h, of the rocket after t seconds is given by $h(t) = 22t - 2t^2$.



   a) How long will it take the rocket to first reach 20m?
   b) Will the rocket every reach a height of 60m?

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ANSWERS

N5 Quadratic Graphs 1

1. A quadratic graph has the equation $y = x^2 - 6x + 14$.
   a) Express the equation in the form $y = (x + a)^2 + b$
   b) Determine the nature & coordinates of the turning point.
   c) Determine the coordinates of the y-intercept.
   d) State the equation of the axis of symmetry.
   e) Sketch and annotate the graph.

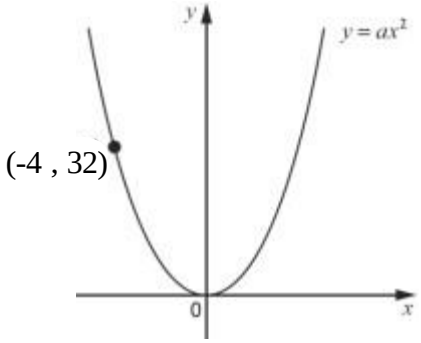
2. A quadratic graph has the equation $y = x^2 - 6x - 16$.
   a) Find the roots of the parabola.
   b) Determine the coordinates of the y-intercept.
   c) Find the coordinates of the turning point.
   d) Sketch and annotate the graph.

ANSWERS

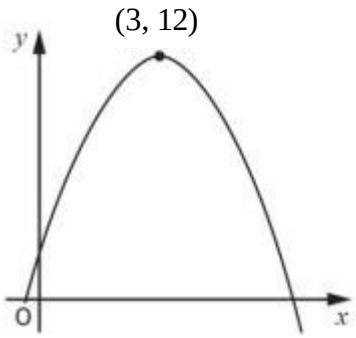
N5 Quadratic Graphs 2

1. Sketch the graph of the parabola with equation: $y = (x - 3)(x + 5)$
   Clearly indicate the turning point and the points where the parabola crosses the y-axis and the x-axis.

2. a) Find the value of a.



(b) The equation of the graph is in the form $y = (x + a)^2 + b$.
State the values of a & b.



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ANSWERS

N5 Trig Equs & Identities

1. Solve these equations for $0° \leq x° \leq 360°$

   a) $6\sin x° + 3 = 8$ (b) $4\tan x° + 7 = 1$

2. The London Eye turns at a steady rate of $h = 6\cos t + 5$ where h is the height of a pod after t seconds. Find **two** times when the height of the pod is 9.6metres.

3. Simplify: a) $\cos^3 x + \cos x \sin^2 x$

   b) $2tan\, x \cos x$

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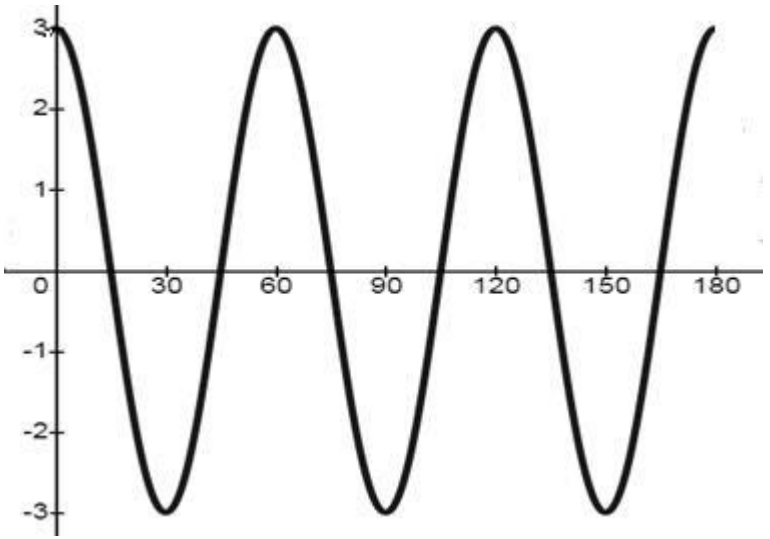
N5 Trig Graphs

1. This graph has an equation of the form $y = a\cos bx$

   State the values of a & b



2. State the amplitude & period of the graph of $y = -2\sin 4x$

3. List the following values in size order, starting with the smallest:

   sin(120) sin(240) sin(360)

   Justify your answer.

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