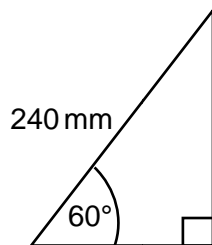


Foundation Check In - 6.02 Algebraic formulae

1. Given $v = \sqrt{u^2 + 2as}$ and $v > 0$, find the value of v when $a = -0.96$, $s = 3.6$ and $u = 4.02$. Give your answer to 2 significant figures.
2. Rearrange the formula to make v the subject of $d = \frac{m}{v}$.
3. A taxi charges an initial £2.50 plus £1.20 per mile travelled. Write an expression for the cost, C , of a taxi journey of m miles.
4. Rearrange the formula to make u the subject of $2as = v^2 - u^2$.
5. Find the acceleration of a ball that goes from rest to 5 m/s in 2 seconds.
6. Show that a triangle which has a base of 12 cm, perpendicular height of 16 cm and diagonal side of 20 cm is a right-angled triangle.
7. Tia states that the value of $\frac{4x+2y}{x-y}$ when $x=2$ and $y=-1$ is 6. Explain why she is wrong.
8. Show that the base length of the right-angled triangle below is 120 mm.



9. The volume of a sphere is 1400 cm^3 . A cone has the same volume and the same size radius as the sphere. Work out the height of the cone, giving your answer to 3 significant figures.

[The volume v of a sphere with radius r is $V = \frac{4}{3}\pi r^3$.]

[The volume v of a cone with radius r and perpendicular height h is $V = \frac{1}{3}\pi r^2 h$.]

10. Cara has £160 to spend on a birthday celebration with her family. She pays £75 for a magician to entertain at the event and she plans to buy each adult an alcoholic drink for £4.50 and each child a bottle of juice for £1.75. Write an expression to find how much money Cara will have remaining after x adults and y children attend the birthday celebration. If seven adults attend the event, what is the maximum number of children that could attend?



GCSE (9–1) MATHEMATICS

Extension

A group of sixth form students are planning to run an end of term disco.
The local youth club offers its hall for hire for £120 per evening.
The students think they will have a maximum of 80 people attending the disco and they want to offer refreshments costing £6 per person.
The ticket price needs to cover the cost of running the disco.

Write an expression for the price of the ticket, T , if p represents the number of people attending the disco.

Work out the price of the ticket if the maximum number of people attend the disco.



GCSE (9-1) MATHEMATICS

Answers

1. 3.0

2. $v = \frac{m}{d}$

3. $C = 2.5 + 1.2m$

4. $u = \sqrt{v^2 - 2as}$

5. 2.5 ms^{-2}

6. Using Pythagoras' theorem, $12^2 + 16^2 = 20^2$ gives $144 + 256 = 400$ so it is a right-angled triangle.

7. $\frac{4 \times 2 + 2 \times -1}{2 - -1} = \frac{6}{3} = 2$. Tia made an error subtracting a negative in the denominator which meant she calculated $6 \div 1 = 6$.

8. $\cos 60 = \frac{a}{240}$

$$a = 240 \cos 60 = 240 \times \frac{1}{2} = 120 \text{ mm}$$

9. 27.8 cm

10. $85 - 4.5x - 1.75y$
30 children

Extension

$$T = \frac{120 + 6p}{p}$$

If $p = 80$, $T = \text{£}7.50$



We'd like to know your view on the resources we produce. By clicking on the 'Like' or 'Dislike' button you can help us to ensure that our resources work for you. When the email template pops up please add additional comments if you wish and then just click 'Send'. Thank you.

OCR Resources: *the small print*

OCR's resources are provided to support the teaching of OCR specifications, but in no way constitute an endorsed teaching method that is required by the Board, and the decision to use them lies with the individual teacher. Whilst every effort is made to ensure the accuracy of the content, OCR cannot be held responsible for any errors or omissions within these resources. We update our resources on a regular basis, so please check the OCR website to ensure you have the most up to date version.

© OCR 2016 - This resource may be freely copied and distributed, as long as the OCR logo and this message remain intact and OCR is acknowledged as the originator of this work.

OCR acknowledges the use of the following content: Maths and English icons: AirOne/Shutterstock.com



Assessment Objective	Qu.	Topic	R	A	G
AO1	1	Substitute numerical values into a complex formula			
AO1	2	Rearrange a formula to change the subject where a reciprocal of the subject appears			
AO1	3	Formulate a simple formula from a real-world context			
AO1	4	Rearrange a formula to change the subject where a power of the subject appears			
AO1	5	Use a kinematic formula to work out acceleration			
AO2	6	Recall and use Pythagoras' theorem			
AO2	7	Substitute positive and negative numbers into an algebraic fraction			
AO2	8	Recall and use trigonometry formula			
AO3	9	Use formulae for the volume of a sphere and a cone			
AO3	10	Formulate an expression involving two variables to solve a real-world problem			

Assessment Objective	Qu.	Topic	R	A	G
AO1	1	Substitute numerical values into a complex formula			
AO1	2	Rearrange a formula to change the subject where a reciprocal of the subject appears			
AO1	3	Formulate a simple formula from a real-world context			
AO1	4	Rearrange a formula to change the subject where a power of the subject appears			
AO1	5	Use a kinematic formula to work out acceleration			
AO2	6	Recall and use Pythagoras' theorem			
AO2	7	Substitute positive and negative numbers into an algebraic fraction			
AO2	8	Recall and use trigonometry formula			
AO3	9	Use formulae for the volume of a sphere and a cone			
AO3	10	Formulate an expression involving two variables to solve a real-world problem			

Assessment Objective	Qu.	Topic	R	A	G
AO1	1	Substitute numerical values into a complex formula			
AO1	2	Rearrange a formula to change the subject where a reciprocal of the subject appears			
AO1	3	Formulate a simple formula from a real-world context			
AO1	4	Rearrange a formula to change the subject where a power of the subject appears			
AO1	5	Use a kinematic formula to work out acceleration			
AO2	6	Recall and use Pythagoras' theorem			
AO2	7	Substitute positive and negative numbers into an algebraic fraction			
AO2	8	Recall and use trigonometry formula			
AO3	9	Use formulae for the volume of a sphere and a cone			
AO3	10	Formulate an expression involving two variables to solve a real-world problem			

Assessment Objective	Qu.	Topic	R	A	G
AO1	1	Substitute numerical values into a complex formula			
AO1	2	Rearrange a formula to change the subject where a reciprocal of the subject appears			
AO1	3	Formulate a simple formula from a real-world context			
AO1	4	Rearrange a formula to change the subject where a power of the subject appears			
AO1	5	Use a kinematic formula to work out acceleration			
AO2	6	Recall and use Pythagoras' theorem			
AO2	7	Substitute positive and negative numbers into an algebraic fraction			
AO2	8	Recall and use trigonometry formula			
AO3	9	Use formulae for the volume of a sphere and a cone			
AO3	10	Formulate an expression involving two variables to solve a real-world problem			

