# Foundation Check In - 6.02 Algebraic formulae

1. Given  and *v* > 0, find the value of *v* when ,  and . Give your answer to 2 significant figures.
2. Rearrange the formula to make *v* the subject of .
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 .
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  when  and  is 6. Explain why she is wrong.
8. Show that the base length of the right-angled triangle below is 120 mm.

240 mm

60°

1. The volume of a sphere is 1400 cm3. 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 .]

[The volume *v* of a cone with radius *r* and perpendicular height *h* is .]

1. 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?

**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.

Answers

1. 3.0
2. 
3. **
4. 
5. 2.5 ms-2
6. Using Pythagoras’ theorem,  gives  so it is a right-angled triangle.
7. . Tia made an error subtracting a negative in the denominator which meant she calculated .
8. 



1. 27.8 cm
2. 

30 children

**Extension**



If , 

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| **Assessment Objective** | **Qu.** | **Topic** | **R** | **A** | **G** |  | **Assessment Objective** | **Qu.** | **Topic** | **R** | **A** | **G** |
| AO1 | 1 | Substitute numerical values into a complex formula |  |  |  |  | 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 | 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 | 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 | 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 |  |  |  |  | AO1 | 5 | Use a kinematic formula to work out acceleration |  |  |  |
| AO2 | 6 | Recall and use Pythagoras’ theorem |  |  |  |  | AO2 | 6 | Recall and use Pythagoras’ theorem |  |  |  |
| AO2 | 7 | Substitute positive and negative numbers into an algebraic fraction |  |  |  |  | AO2 | 7 | Substitute positive and negative numbers into an algebraic fraction |  |  |  |
| AO2 | 8 | Recall and use trigonometry formula |  |  |  |  | AO2 | 8 | Recall and use trigonometry formula |  |  |  |
| AO3 | 9 | Use formulae for the volume of a sphere and a cone |  |  |  |  | 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 |  |  |  |  | AO3 | 10 | Formulate an expression involving two variables to solve a real-world problem |  |  |  |
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