Mathematics

Level 1

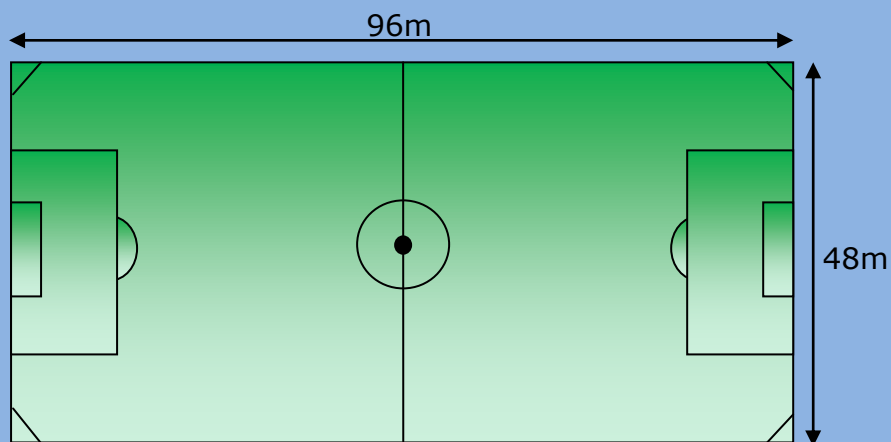**Challenge:** Football Crazy

Solutions

Task 1

The home ground is in urgent need of repair before the new season begins. Your first job as club secretary is to find out what needs to be done, and then order the appropriate materials.

You identify that the pitch needs re-turfing and the fence surrounding the pitch needs replacing. Before you can make an order, you need to work out how much turf and fencing you require. To do this, you must calculate the area and perimeter of the pitch.

Look at the diagram below and make the required calculations. Write your answers into the boxes provided. Don't forget to include the unit of measurement in your answers.

Show your working out in the 'Your notes' area.

96m

48m

The area of the pitch is: $4608m^2$
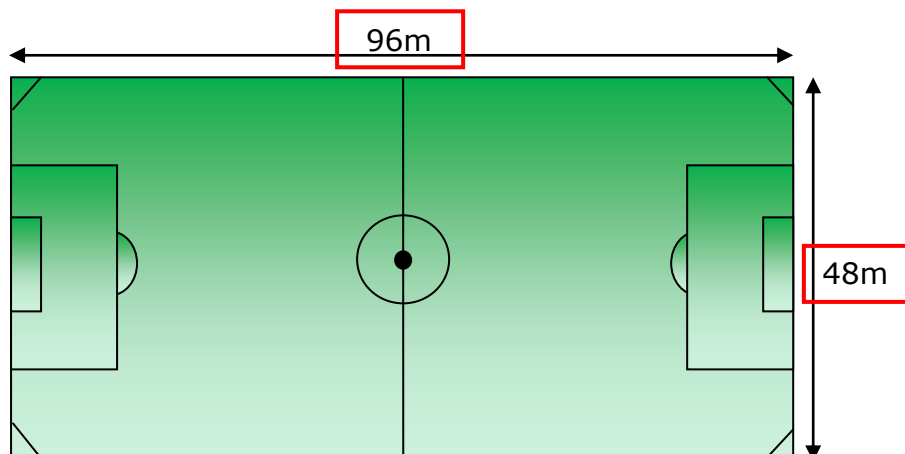
The perimeter of the pitch is: 288m

Feedback

Area

Area is the space on a flat surface and is measured in square units; the choice of unit depends on the size of object. For example, something large, like a garden or a football pitch, is usually measured in metres or kilometres. Something smaller, like a tabletop or a fishpond, would usually be measured in centimetres or millimetres.

When you are working out area, you need to multiply the length and width together.

In this example, the length is 96m and the width is 48m, so 96 x 48 = **4608m^2**.

Perimeter

The perimeter of a shape is the distance around its edge. It can be calculated using metric or imperial measurements; for example, metres, centimetres, feet, yards etc.

To work out the perimeter of the football pitch, add all lengths and widths together:

96 + 48 + 96 + 48 = **288m.**

Task 2

So, you've worked out how much material you require, now you need to calculate the total cost. You find out that turf costs £4.48 per square metre and fencing costs £19.99 per panel. The panel measures 1m in length. Coopers, the company you are going to buy the material from, also gives a £150 discount for orders over £20000.

Complete the order form below by writing the missing amounts into the blank boxes.

Show your working out in the 'Your notes' area.

Coopers

Quality assurance guaranteed

Order Form

Description	Amount required	Cost (£)
1 ➤ **Turf**	4608m^2	20643.84
2 ➤ **Fencing**	288m	5757.12
	Sub total	26400.96 ◄ **3**
	Discount	150.00
	Total cost	26250.96 ◄ **4**

Feedback

To work out the total cost of materials, you firstly need to break the calculation down into smaller parts.

1 → Let's start with the cost of the turf. We know that 1 square metre costs £4.48 so to find out the cost of 4608m^2 you need to multiply 4.48 by 4608:

4.48 x 4608 = **£20643.84**

2 → Now let's work out the cost of the fencing. We know that 1 panel measures 1m and costs £19.99, so to find out the cost of 288m you need to multiply 19.99 by 288:

19.99 x 288 = **£5757.12**

3 → You now need to add both these amounts together to get a sub total:

20643.84 + 5757.12 = **£26400.96**

4 → Finally, you need to apply the discount of £150:

26400.96 – 150 = **£26250.96**

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Task 3

Your final task is to organise the cup draws for the coming season. This is done by placing the names of all the teams in to a container then drawing them out one by one.

What is the probability that Burton Albion will be the first team drawn? Circle the answer you think is correct.

Show your working out in the 'Your notes' area.

Barrow	Mansfield Town
Burton Albion	Northwick Victoria
Crawley Town	Oxford United
Eastbourne Borough	Rushden & Diamonds
Ebbsfleet United	Salisbury City
Forest Green Rovers	Stevenage Borough
Grays Athletic	Torquay United
Histon	Weymouth
Kettering Town	Woking
Kidderminster Harriers	Wrexham

Burton Albion **v** ?

2%	**5%**	10%	16%

Feedback

Probability is about working out how likely something is to happen. It can be expressed as a fraction, a decimal or a percentage.

The most common way of showing probability is as a fraction:

$$\text{Probability} = \frac{\text{Number of successful outcomes}}{\text{Total possible outcomes}}$$

In the challenge example, the number of successful outcomes is 1 (Burton Albion being drawn) and the total possible outcomes is 20 (the total number of teams). As a fraction this is 1/20.

To change a fraction to a percentage you can use the following sum:

$$1/20 \times 100 = (1 \div 20) \times 100$$
$$= (0.05) \times 100$$
$$= 5$$

So, 1/20 = 5%.