



Maths
Junior Certificate
Higher Level

Past Exam Questions on
Equations from Words/Diagrams

Q4 Part (b) 2012 Paper 1

- (b) Electricity is charged to a consumer at a day rate and at a night rate.



Day rate units are charged at 14 cent per unit and night rate units are charged at 7 cent per unit.

A consumer uses a total of 1100 units for a billing period, at a cost of €129.50.

- (i) By letting x equal the number of day rate units used and y equal the number of night rate units used, write two equations to represent the above information.
- (ii) Solve these equations to find the number of each type of unit used.

Q3 Part (b) 2010 Paper 1

- (b) A builders' supplier sells two types of copper pipes.

One has a narrow diameter and costs € x per length.

The other has a wider diameter and costs € y per length.



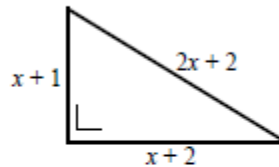
Tony buys 14 lengths of the narrow diameter pipes and 10 lengths of the wider diameter pipes at a cost of €555.

Gerry buys 12 lengths of the narrow diameter pipes and 5 lengths of the wider diameter pipes at a cost of €390.

- (i) Write two equations to represent the above information.
- (ii) Solve these equations to find the cost of a length of each type of copper pipe.

Q4 Part (c) 2009 Paper 1

- (c) The lengths of the sides of a right-angled triangle are as shown in the diagram.



- (i) Using the theorem of Pythagoras, write an equation in x .
- (ii) ✍ Solve this equation to find x correct to 2 decimal places.

Q3 Part (b) 2008 Paper 1

- (b) An examination paper consists of 40 questions.
5 marks are given for each correct answer.
3 marks are deducted for each incorrect answer.
Kenny answered all 40 questions, getting x correct and getting y incorrect.
His total score for the examination was 56 marks.



- (i) Write two equations to represent the above information.
- (ii) ✍ Solve these equations to find how many questions Kenny answered correctly.

Q4 Part (c) 2008 Paper 1

- (c) In a certain week, x people shared equally in a club lotto prize of €2000.
- (i) Write down an expression in x for the amount that each person received.

The following week, $x + 1$ people shared equally in the prize of €2000.

- (ii) Write down an expression in x for the amount that each person received that week.

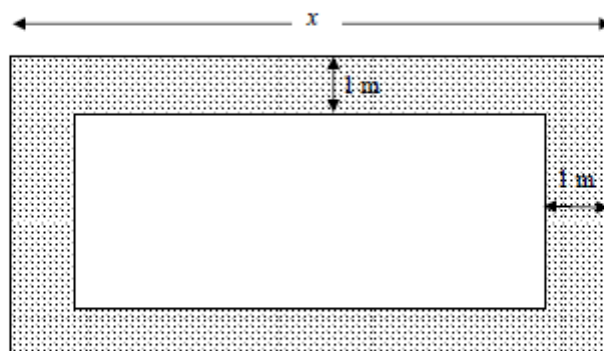
In the second week, each winner received €100 less.

- (iii) Write down an equation in x to represent the above information.
- (iv) \sphericalangle Solve this equation to find the value of x .



Q6 Part (a) 2008 Paper 1

6. (a) The diagram shows a rectangular garden of perimeter 24 m.
The length of the garden is x m.
Write down an expression in x for the width of the garden.



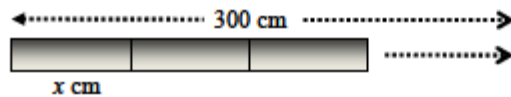
- (b) Paving of width 1 m is placed around the garden as shown.
- (i) Write expressions in x for the length and width of the inner section.
- (ii) \sphericalangle Show that the area, in m^2 , of the inner section is $-x^2 + 12x - 20$.

Q4 Part (c) 2010 Paper 1

- (c) Rectangular tiles are to be placed side by side on a wall.

Each tile has a length of x cm.

$\frac{300}{x}$ of these tiles are required.



- (i) If each tile was 1 cm longer, write down an expression in x for the number of tiles that would now be required.
- (ii) If the longer tiles were used, the number of tiles required would decrease by 10.
 \sphericalangle Write an equation in x to represent this information.
- (iii) \sphericalangle Solve this equation to find the value of x .

Q3 Part (c) 2009 Paper 1

- (c) A swimming pool can be filled by a large pipe operating alone in 4 hours.

- (i) What fraction of the pool can be filled by this pipe in 1 hour?

The swimming pool can be filled by a small pipe operating alone in x hours.

- (ii) \sphericalangle Derive an expression in x for the fraction of the pool filled by the two pipes working together in 1 hour.

It takes 3 hours for the two pipes working together to fill the pool.

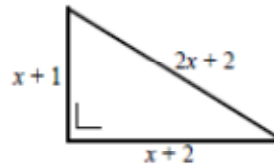
- (iii) \sphericalangle Find x .



Q4 Part (c) 2007 Paper 1

$$y = 2x + 12.$$

- (c) The lengths of the sides of a right-angled triangle are as shown in the diagram.



- (i) Using the theorem of Pythagoras, write an equation in x .
- (ii) Solve this equation to find x correct to 2 decimal places.

Q2 Part (b) 2006 Paper 1

- (b) 70 teenagers responded to a survey about holiday destinations.
30 had travelled to France,
26 had travelled to Spain
and 28 had travelled to Italy.
12 had travelled to both France and Spain,
8 had travelled to both Spain and Italy,
while x had travelled to France and Italy only.
4 teenagers had travelled to all three countries.
Twice as many had never travelled to any of these destinations as had travelled to France and Italy only.




- (i) Represent the above information on a Venn diagram.
- (ii) Find the number of teenagers who had travelled to France only.


Q4 Part (c) 2006 Paper 1

- (c) A farmer must feed bales of hay to his cattle for a total of 90 days.
He feeds the cattle 540 bales of hay over a number of days.
Their average consumption over this period is x bales per day.
- (i) Write an expression in x for the number of days taken to consume the 540 bales.
- If the average consumption is increased by 1 bale per day, then the cattle consume 300 bales in the remaining days.
- (ii) Write an expression in x for the number of days taken to consume the 300 bales.
- (iii) Using the above information, write an equation in x .
- (iv) ✎ Solve this equation to find the value of x and the number of days taken to consume the first 540 bales.

Q5 Part (a) 2006 Paper 1

5. (a) The temperature on Sunday is x° .
The temperature rose by 3° each day for the next two days.
The temperature then dropped by 4° each day for the next three days.
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- ✎ Derive an expression in x for the temperature on the fifth day (i.e. Friday).

Q3 Part (c) 2005 2013

- (c) A box of drinking chocolate powder costs €3.60.
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- (i) If the box contains x grams of powder, write an expression in x to represent the cost of 1 gram of the powder.
- During a promotion, the manufacturer adds in to the box an extra 30 grams of powder.
The cost of the box of drinking chocolate remains at €3.60.
- (ii) Write an expression in x to represent the cost of 1 gram of the powder during the promotion.
- Each gram of powder, in this case, now costs 1 cent less.
- (iii) Write an equation in x to represent the above information.
- (iv) ✎ Solve this equation to find how many grams of powder are in the box during the promotion.

Q5 Part (b) 2005 Paper 1

- (b) In a school of 430 students, 250 students study History, 240 students study Geography.

Let x represent the number of students who study neither History nor Geography.

The number of students who study both History and Geography is 3 times the number who study neither of these subjects.

- (i) ✍ Represent this information on a Venn diagram.
- (ii) ✍ Write down and simplify an expression in x for the total number of students in the school.
- (iii) ✍ Use this expression to find the number of students who study neither History nor Geography.