Factorising / Expanding, Factorising & Solving Quadratics (F)

A collection of 9-1 Maths GCSE Sample and Specimen questions from AQA, OCR, Pearson-Edexcel and WJEC Eduqas.

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Total Marks:	

1. Solve by factorising.

$x^2 + 8x + 15 = 0$

$(x+5)(x+3)=0$

$x+5=0$ or $x+3=0$

x = -5 or -3 [3]

2. Amin is attempting to solve the following equation.

$(x + 1)(x + 4) = (x - 2)(x - 3)$

His incorrect solution is shown below.

	$(x+1)(x+4) = (x-2)(x-3)$
Step 1	$x^2 + 4x + x + 4 = x^2 - 3x - 2x + 6$
Step 2	$x^2 + 5x + 4 = x^2 - x + 6$
Step 3	$5x + 4 = -x + 6$
Step 4	$6x + 4 = 6$
Step 5	$6x = 2$
Step 6	$x = \frac{1}{3}$

(a) Identify the step in which Amin made his first error and explain why this step is incorrect.

Step 2 $-3x - 2x = -5x$

Amin added $2x$ instead of $-2x$. [2]

(b) Write out a correct solution to the equation.

$x^2 + 5x + 4 = x^2 - 5x + 6$

$10x = 2$

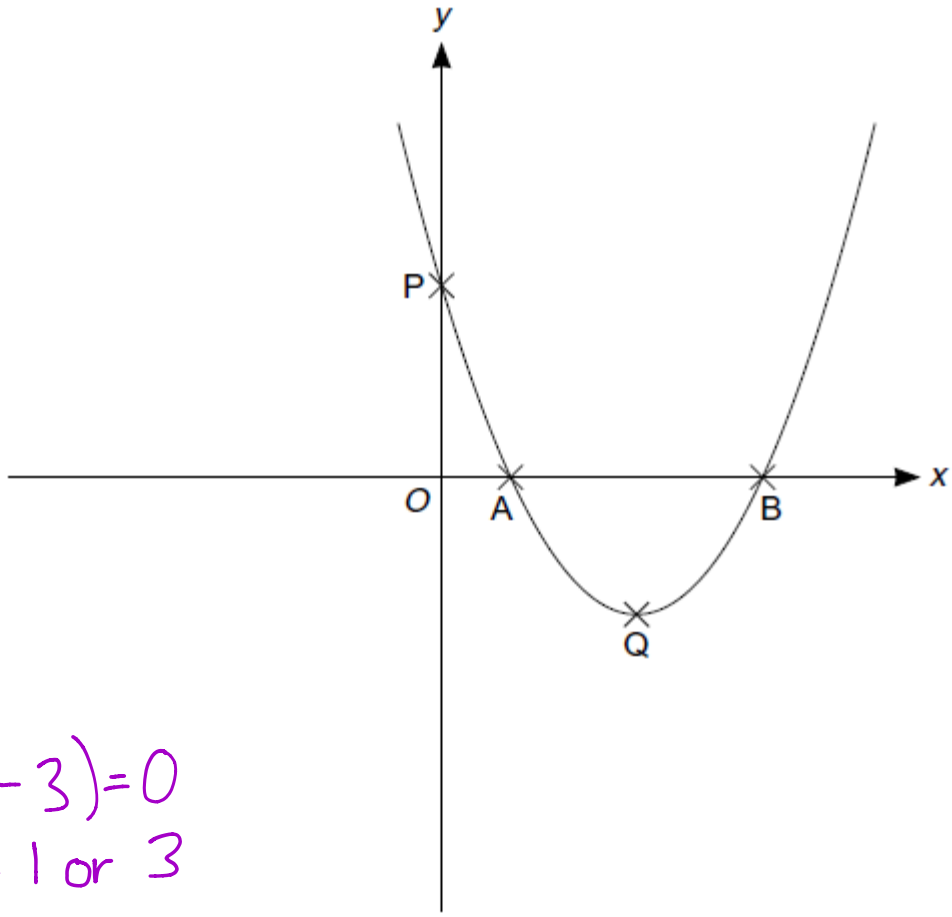
$x = \frac{2}{10} = \frac{1}{5}$ [2]

3. Factorise.

$x^2 - 2x - 8$

$(x-4)(x+2)$ [2]

4. This is a sketch of the graph of y = (x – 1)(x – 3).



$(x-1)(x-3)=0$
so $x = 1$ or 3

(a) Write down the coordinates of points A and B.

$y = -1x - 3 = 3$

(a) A (1 , 0)
B (3 , 0)
[2]

(b) Work out the coordinates of point P.

(b) P (0 , 3) [2]

(c) Work out the coordinates of the turning point Q.

using symmetry, $x = 2$
$y = (2-1)(2-3) = 1 \times -1$

(c) Q (2 , −1) [3]

5. (a) Factorise 3f + 9

$3(f+3)$ [1]

(b) Factorise $x^2 - 2x - 15$

$(x-5)(x+3)$ [2]

6. Factorise $y^2 + 27y$

$y(y+27)$ [1]

7. Factorise $10x - 15$

$5(2x-3)$ [1]

8. Expand and simplify $(y + 5)(y - 4)$

$y^2+5y-4y-20 = y^2+y-20$ [2]

9. (a) Factorise fully $9a^2 - 6a$

$3a(3a-2)$ [2]

(b) Solve $x^2 - 12x + 20 = 0$

$(x-10)(x-2)=0$

$x = 10$ or $x = 2$ [3]

10. Circle the equation with roots 4 and -8

$4x(x - 8) = 0$	$(x - 4)(x + 8) = 0$
$x^2 - 32 = 0$	$(x + 4)(x - 8) = 0$

[1]

11. Factorise the following expressions.

(a) $6x^2 + 8x$

$2x(3x+4)$ [2]

(b) $x^2 - 100$

$(x+10)(x-10)$ [1]

12. Factorise $5u^2w^4 \times 7uw^3$

$35u^3w^7$ [2]

13. Expand and simplify $(x + 3)(x - 1)$

$x^2+3x-x-3$

$= x^2+2x-3$ [2]

14. Factorise $x^2 - 16$

$(x+4)(x-4)$

[1]

15. Factorise $x^2 + 3x - 4$

$(x+4)(x-1)$

[2]

16. Factorise $15x + 35y - 40z$

$5(3x+7y-82)$

[1]

17. Factorise $x^2 - y^2$

$(x+y)(x-y)$

[1]

CREDITS AND NOTES

Question	Awarding Body	Question	Awarding Body
1	OCR	13	Pearson Edexcel
2	OCR	14	Pearson Edexcel
3	OCR	15	Pearson Edexcel
4	OCR	16	AQA
5	Pearson Edexcel	17	AQA
6	Pearson Edexcel		
7	Pearson Edexcel		
8	AQA		
9	AQA		
10	AQA		
11	WJEC Eduqas		
12	Pearson Edexcel		

Notes:

These questions have been retyped from the original sample/specimen assessment materials and whilst every effort has been made to ensure there are no errors, any that do appear are mine and not the exam board s (similarly any errors I have corrected from the originals are also my corrections and not theirs!).

Please also note that the layout in terms of fonts, answer lines and space given to each question does not reflect the actual papers to save space.

These questions have been collated by me as the basis for a GCSE working party set up by the GLOW maths hub - if you want to get involved please get in touch. The objective is to provide support to fellow teachers and to give you a flavour of how different topics "could" be examined. They should not be used to form a decision as to which board to use. There is no guarantee that a topic will or won't appear in the "live" papers from a specific exam board or that examination of a topic will be as shown in these questions.

Links:

AQA http://www.aqa.org.uk/subjects/mathematics/gcse/mathematics-8300

OCR http://ocr.org.uk/gcsemaths

Pearson Edexcel http://qualifications.pearson.com/en/qualifications/edexcel-gcses/mathematics-2015.html

WJEC Eduqas http://www.eduqas.co.uk/qualifications/mathematics/gcse/

Contents:

This version contains questions from:

AQA – Sample Assessment Material, Practice set 1 and Practice set 2

OCR – Sample Assessment Material and Practice set 1

Pearson Edexcel – Sample Assessment Material, Specimen set 1 and Specimen set 2.

WJEC Eduqas – Sample Assessment Material