HIGHER

7.4 Quadratic Formula: Test Pack

EDEXCEL 1MA1 · Calculator allowed · about 60 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Solve $2x^2 + 5x + 1 = 0$. Give your solutions correct to 3 decimal places.

(Total for Question 1 is 3 marks)

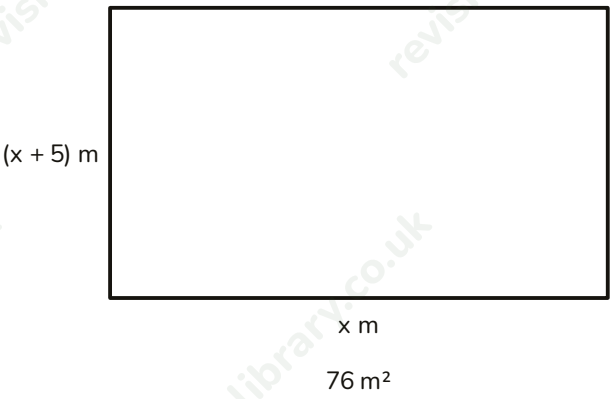
2 Show that $x^2 + 5x + 11 = 0$ has no real solutions.

(Total for Question 2 is 2 marks)

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3 A rectangle has width x m and length (x + 5) m. The area of the rectangle is 76 m². Work out the value of x. Give your answer correct to 3 significant figures.

Diagram NOT accurately drawn



(Total for Question 3 is 4 marks)

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4 Show that $4x^2 - 2x + 12 = 0$ has no real solutions.

(Total for Question 4 is 2 marks)

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5 Solve $x^2 - 4x + 2 = 0$. Give your solutions in the form $p + \sqrt{q}$ and $p - \sqrt{q}$, where p and q are integers.

(Total for Question 5 is 4 marks)

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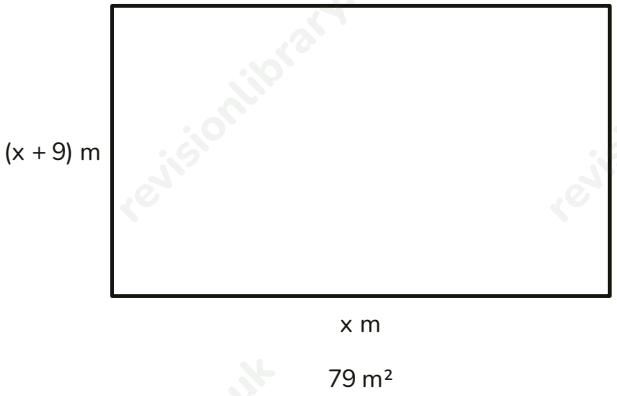
6 Show that $4x^2 + 5x + 10 = 0$ has no real solutions.

(Total for Question 6 is 2 marks)

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7 A rectangle has width x m and length (x + 9) m. The area of the rectangle is 79 m². Work out the value of x. Give your answer correct to 3 significant figures.

Diagram NOT accurately drawn



(Total for Question 7 is 4 marks)

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8 Solve $4x^2 - 8x - 3 = 0$. Give your solutions correct to 2 decimal places.

(Total for Question 8 is 3 marks)

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9 Solve $2x^2 + 8x = 5$. Give your solutions correct to 2 decimal places.

(Total for Question 9 is 4 marks)

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10 Solve $2x^2 + 4x - 5 = 0$. Give your solutions correct to 3 decimal places.

(Total for Question 10 is 3 marks)

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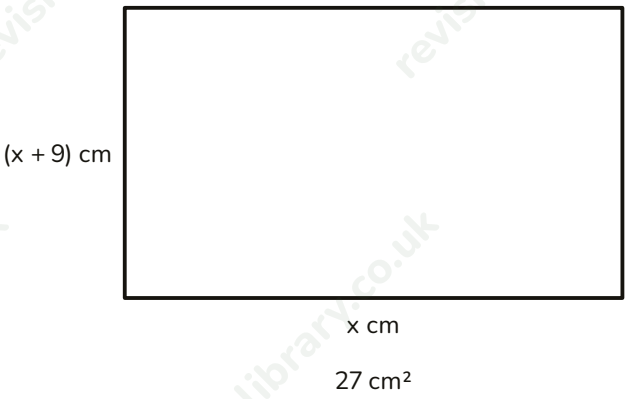
11 Solve $4x^2 - 2x - 1 = 0$. Give your solutions correct to 3 decimal places.

(Total for Question 11 is 3 marks)

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12 A rectangle has width x cm and length (x + 9) cm. The area of the rectangle is 27 cm². Work out the value of x. Give your answer correct to 3 significant figures.

Diagram NOT accurately drawn



(Total for Question 12 is 4 marks)

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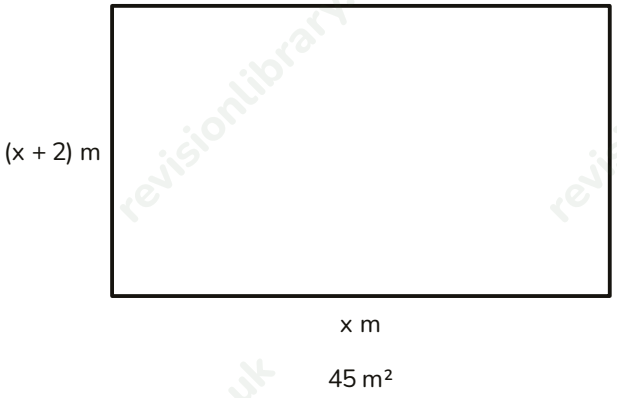
13 Show that $2x^2 - 3x + 4 = 0$ has no real solutions.

(Total for Question 13 is 2 marks)

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14 A rectangle has width x m and length (x + 2) m. The area of the rectangle is 45 m². Work out the value of x. Give your answer correct to 3 significant figures.

Diagram NOT accurately drawn



(Total for Question 14 is 4 marks)

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Mark scheme · 7.4 Quadratic Formula: Test Pack

Question 1

substitutes into the quadratic formula correctly	**M1**
discriminant 17 evaluated	**M1**
x = -2.281 or x = -0.219 cao	**A1**

Answer: x = -2.281 or x = -0.219

Question 2

substitutes a = 1, b = 5, c = 11 into b^2 - 4ac	**M1**
-19 and a conclusion that it is negative	**A1**

Answer: b^2 - 4ac = -19, which is negative

Question 3

x(x + 5) = 76	**M1**
x^2 + 5x - 76 = 0 and substitutes into the formula	**M1**
positive solution selected	**M1**
6.57 m cao	**A1**

Answer: 6.57 m

Question 4

substitutes a = 4, b = -2, c = 12 into b^2 - 4ac	**M1**
-188 and a conclusion that it is negative	**A1**

Answer: b^2 - 4ac = -188, which is negative

Question 5

substitutes into the quadratic formula correctly	**M1**
discriminant 8 evaluated	**M1**
$\sqrt{8} = 2\sqrt{2}$ or equivalent	**A1**
$x = 2 + \sqrt{2}$ or $x = 2 - \sqrt{2}$	**A1**

Answer: $x = 2 + \sqrt{2}$ or $x = 2 - \sqrt{2}$

Question 6

substitutes a = 4, b = 5, c = 10 into b^2 - 4ac	**M1**
-135 and a conclusion that it is negative	**A1**

Answer: b^2 - 4ac = -135, which is negative

Question 7

x(x + 9) = 79	**M1**
x^2 + 9x - 79 = 0 and substitutes into the formula	**M1**
positive solution selected	**M1**
5.46 m cao	**A1**

Answer: 5.46 m

Question 8

substitutes into the quadratic formula correctly	**M1**
discriminant 112 evaluated	**M1**
x = -0.32 or x = 2.32 cao	**A1**

Answer: x = -0.32 or x = 2.32

Question 9

rearranges to $2x^2$ + 8x - 5 = 0	**M1**
substitutes into the quadratic formula correctly	**M1**
one correct solution	**A1**
x = -4.55 or x = 0.55 cao	**A1**

Answer: x = -4.55 or x = 0.55

Question 10

substitutes into the quadratic formula correctly	**M1**
discriminant 56 evaluated	**M1**
x = -2.871 or x = 0.871 cao	**A1**

Answer: x = -2.871 or x = 0.871

Question 11

substitutes into the quadratic formula correctly	**M1**
discriminant 20 evaluated	**M1**
x = -0.309 or x = 0.809 cao	**A1**

Answer: x = -0.309 or x = 0.809

Question 12

x(x + 9) = 27	**M1**
x^2 + 9x - 27 = 0 and substitutes into the formula	**M1**
positive solution selected	**M1**
2.37 cm cao	**A1**

Answer: 2.37 cm

Question 13

substitutes a = 2, b = -3, c = 4 into b^2 - 4ac	**M1**
-23 and a conclusion that it is negative	**A1**

Answer: b^2 - 4ac = -23, which is negative

Question 14

x(x + 2) = 45	**M1**
x^2 + 2x - 45 = 0 and substitutes into the formula	**M1**
positive solution selected	**M1**
5.78 m cao	**A1**

Answer: 5.78 m

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