IB MATHS AI HL · UNIT 2

Solving Equations: exam practice

10 questions · 24 marks · worked solutions and markschemes

Name _____ Date _____ Score / 24

- Answer every question before you look at the solutions. They start after the last question, with the marks for each line: M for method, A for accuracy, R for reasoning.
- Online, with more practice: ibmathrevision.com/hlai/solving-equations-exam-practice

1. **2 marks · Paper 1 style · calculator allowed**

Solve $2x^2 - 7x + 3 = 0$.

Find x. **[2]**

2. **2 marks · Paper 1 style · calculator allowed**

Solve $4 \times 1.5^x = 81$.

Find x. **[2]**

3. **2 marks · Paper 2 style · calculator allowed**

Solve $0.3x^2 + 1.2x - 4 = 0$.

Find x. **[2]**

4. **2 marks · Paper 1 style · calculator allowed**

The sum of a number and its square is 56.

Find the two possible numbers. **[2]**

5. **2 marks · Paper 1 style · calculator allowed**

Solve $5^{2x-1} = 125$.

Find x. **[2]**

6. **2 marks · Paper 2 style · calculator allowed**

Use technology to solve $x^2 - 3 = 2\sqrt{x+1}$.

Find the solution. **[2]**

7. **3 marks · Paper 2 style · calculator allowed**

Solve $3e^{0.2x} = x + 8$.

Find all solutions. **[3]**

8. 3 marks · Paper 2 style · calculator allowed

A right-angled triangle has sides x, $x+7$ and $x+8$ cm.

Find x. **[3]**

9. 3 marks · Paper 2 style · calculator allowed

Solve $\log_{10}(x)+\log_{10}(x+3)=1$.

Find x. **[3]**

10. 3 marks · Paper 2 style · calculator allowed

Solve $2^{x}=3^{x-1}$.

Find x. **[3]**

Answers and worked solutions

Question 1 — 2 marks

Answer: $x = \frac{1}{2}, x = 3$

$(2x - 1)(x - 3) = 0$ **M1**

$x = \frac{1}{2}, x = 3$ **A1**

Question 2 — 2 marks

Answer: $x = 7.42$

$1.5^x = 20.25$ **M1**

$x = 7.42$ **A1**

Question 3 — 2 marks

Answer: $x = 2.16, x = -6.16$

GDC **(M1)**

$x = 2.16, x = -6.16$ **A1**

Question 4 — 2 marks

Answer: 7 or -8

$x^2 + x - 56 = 0$ **M1**

$x = 7, x = -8$ **A1**

Question 5 — 2 marks

Answer: 2

$2x - 1 = 3$ **M1**

$x = 2$ **A1**

Question 6 — 2 marks

Answer: $x = 2.61$

GDC **(M1)**

$x = 2.61$ **A1**

Question 7 — 3 marks

Answer: $x = -7.30, x = 8.53$

GDC intersections **M1**

$x = -7.30$ **A1**

$x = 8.53$ **A1**

Question 8 — 3 marks

Answer: 5

$x^2 + (x + 7)^2 = (x + 8)^2$ **M1**

$x^2 - 2x - 15 = 0$ **A1**

$x = 5$ **A1**

Question 9 — 3 marks

Answer: 2

$x(x + 3) = 10$ **M1**

$x^2 + 3x - 10 = 0$ **A1**

$x = 2$ **A1**

Question 10 — 3 marks

Answer: $x = 2.71$

$x \ln 2 = (x - 1) \ln 3$ **M1**

$x = \frac{\ln 3}{\ln 3 - \ln 2}$ **A1**

$x = 2.71$ **A1**

Every solution is also on ibmathrevision.com/hlai/solving-equations-exam-practice
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