1st Class Maths

Equations with Indices

Revise this topic →

← Check your work

This booklet features original exam style questions designed by me. They do not feature in past papers but are good practice for your exams.

The content is designed to reflect the style of the AQA Level 2 Certificate in Further Maths.
It may not be suitable for other courses.

@1stclassmaths

Answer **all** questions in the spaces provided.

Do not write outside the box

1 Solve $(4x^3)^{\frac{1}{2}} = 250$ **[3 marks]**

Answer _____

2 Solve $4x^{\frac{1}{3}} - x^{-\frac{1}{3}} = 0$ **[3 marks]**

Answer _____

3 Solve $9x^{\frac{3}{2}} = \frac{4}{\sqrt{x}}$ **[3 marks]**

Answer _____

Do not write outside the box

4 Solve $\dfrac{(8x^{1.5})^2}{\sqrt[4]{x^9}} = 1$ **[4 marks]**

Answer _____

5 Solve $9^x \times \dfrac{1}{27} = \left(\dfrac{1}{3^x}\right)^x$ **[4 marks]**

Answer _____

17

Do not write outside the box

6 Solve $\dfrac{\sqrt{5^x}}{25^{3x}} = 0.2$ **[4 marks]**

Answer _____

7 Solve $16^x = \dfrac{(8^3)^3 + (2^6)^4}{36}$ **[4 marks]**

Answer _____

Do not write outside the box

8 Solve $9^x = \dfrac{2^3}{3^{50} - 3^{48}}$ **[4 marks]**

Answer _____

9 Solve $\dfrac{(5^x)^x}{25^x} = 125$ **[4 marks]**

Answer _____

16

Do not write outside the box

10 Solve $125^3 \times 25^{(x+1)} = 5^{20}$ **[3 marks]**

Answer _____

11 Solve $27^4 \times 81^{2x} = 0.\dot{3}$ **[3 marks]**

Answer _____

Do not write outside the box

12 By multiplying both sides of the equation by $x^{\frac{1}{2}}$

Solve $x^{\frac{3}{2}} + 20x^{-\frac{1}{2}} = 9x^{\frac{1}{2}}$

You **must** show your working. **[3 marks]**

Answer _____

13 By multiplying both sides of the equation by $x^{\frac{1}{2}}$

Solve $x^{\frac{3}{2}} + 24x^{-\frac{1}{2}} = 14x^{\frac{1}{2}}$

You **must** show your working. **[3 marks]**

Answer _____

12

Do not write outside the box

14 By multiplying both sides of the equation by $x^{\frac{1}{2}}$

Solve $x^{\frac{3}{2}} + x^{\frac{1}{2}} = 12x^{-\frac{1}{2}}$ for $x > 0$

You **must** show your working. **[3 marks]**

Answer _____

15 By multiplying both sides of the equation by $x^{\frac{1}{2}}$

Solve $2x^{\frac{3}{2}} = 3x^{\frac{1}{2}} + 4x^{-\frac{1}{2}}$ for $x > 0$

Give your answer to 3 significant figures.
You **must** show your working. **[4 marks]**

Answer _____

Do not write outside the box

16 By multiplying both sides of the equation by $x^{\frac{1}{3}}$

Solve $x^{\frac{5}{3}} + 2x^{\frac{2}{3}} = 15x^{-\frac{1}{3}}$

You **must** show your working. **[3 marks]**

Answer _____

17 By multiplying both sides of the equation by $x^{\frac{1}{3}}$

Solve $x^{\frac{5}{3}} + 30x^{-\frac{1}{3}} = 11x^{\frac{2}{3}}$

You **must** show your working. **[3 marks]**

Answer _____

13

Do not write outside the box

18 By multiplying both sides of the equation by $x^{\frac{1}{5}}$

Solve $x^{\frac{9}{5}} = 7x^{\frac{4}{5}} - 6x^{-\frac{1}{5}}$

You **must** show your working. **[3 marks]**

Answer _____

19 By multiplying both sides of the equation by $x^{\frac{2}{5}}$

Solve $x^{\frac{8}{5}} + 12x^{-\frac{2}{5}} = 8x^{\frac{3}{5}}$

You **must** show your working. **[3 marks]**

Answer _____

Do not write outside the box

20 By expanding and simplifying, solve

$$\left(2x^{-\frac{1}{2}} + x^{\frac{3}{2}}\right)^2 = 9 + x^3$$

Give your answers to 3 significant figures. **[6 marks]**

Answer _____

12