JP Maths Revision

Attempt the paper before watching the solutions!

https://www.youtube.com/@JPMathsRevision

HIGHER TIER

Fractional and Negative Indices

INSTRUCTIONS

- Use **black ink** or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- You must **show all your working.**
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.

INFORMATION

- The marks for **each** question are shown in brackets– *use this as a guide as to how much time to spend on each question.*

ADVICE

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

You've got this!

1. Work out $64^{\frac{1}{2}}$

.....

(Total for Question 1 is 1 mark)

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2. Work out $81^{\frac{1}{2}}$

.....

(Total for Question 2 is 1 mark)

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3. Work out $125^{\frac{1}{3}}$

.....

(Total for Question 3 is 1 mark)

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4. Work out $16^{\frac{1}{2}}$

.....

(Total for Question 4 is 1 mark)

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5. Work out $49^{\frac{1}{2}}$

.....

(Total for Question 5 is 1 mark)

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6. Work out $8^{\frac{1}{3}}$

.....

(Total for Question 6 is 1 mark)

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7. Work out $64^{\frac{2}{3}}$

.....

(Total for Question 7 is 2 marks)

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8. Work out $27^{\frac{2}{3}}$

.....

(Total for Question 8 is 2 marks)

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9. Work out $16^{\frac{3}{2}}$

.....

(Total for Question 9 is 2 marks)

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10. Work out $81^{\frac{3}{2}}$

.....

(Total for Question 10 is 2 marks)

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11. Work out $125^{\frac{4}{3}}$

.....

(Total for Question 11 is 2 marks)

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12. Work out $32^{\frac{2}{5}}$

.....

(Total for Question 12 is 2 marks)

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13. Work out $4^{-\frac{1}{2}}$

.....

(Total for Question 13 is 2 marks)

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14. Work out $25^{-\frac{1}{2}}$

.....

(Total for Question 14 is 2 marks)

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15. Work out $8^{-\frac{1}{3}}$

.....

(Total for Question 15 is 2 marks)

---

16. Work out $27^{-\frac{2}{3}}$

.....

(Total for Question 16 is 2 marks)

---

17. Work out $16^{-\frac{3}{2}}$

.....

(Total for Question 17 is 2 marks)

---

18. Work out $81^{-\frac{3}{2}}$

.....

(Total for Question 18 is 2 marks)

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19. Work out $\left(\frac{1}{9}\right)^{-\frac{1}{2}}$

.....

(Total for Question 19 is 2 marks)

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20. Work out $\left(\frac{1}{8}\right)^{-\frac{1}{3}}$

.....

(Total for Question 20 is 2 marks)

21. Work out $\left(\frac{1}{16}\right)^{-\frac{3}{4}}$

.....

(Total for Question 21 is 2 marks)

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22. Work out $\left(\frac{25}{16}\right)^{\frac{1}{2}}$

.....

(Total for Question 22 is 2 marks)

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23. Work out $\left(\frac{81}{16}\right)^{\frac{3}{4}}$

.....

(Total for Question 23 is 2 marks)

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24. Work out $\left(\frac{16}{81}\right)^{-\frac{1}{2}}$

.....

(Total for Question 24 is 2 marks)

---

25. Work out $\left(\frac{8}{27}\right)^{-\frac{2}{3}}$

.....

(Total for Question 25 is 2 marks)

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26. Work out $\left(\frac{25}{16}\right)^{-\frac{3}{2}}$

.....

(Total for Question 26 is 2 marks)

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27. $8^n = 4$

Find the value of n

.....

(Total for Question 27 is 2 marks)

28. $27^n = 9$

Find the value of n

.....

(Total for Question 28 is 2 marks)

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29. Work out

$32^{\frac{3}{5}} + 4^{-1}$

.....

(Total for Question 29 is 3 marks)

---

30. Work out

$125^{\frac{2}{3}} - \left(\frac{1}{2}\right)^{-2}$

.....

(Total for Question 30 is 3 marks)

31. Work out

$$\frac{64^{\frac{1}{2}} + 8^{\frac{2}{3}}}{2^{-1}}$$

.....

(Total for Question 31 is 4 marks)

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32. Work out

$$\frac{\left(1\frac{7}{9}\right)^{-\frac{1}{2}} \times \left(2\frac{2}{3}\right)}{2^{-3}}$$

.....

(Total for Question 32 is 4 marks)

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33. $2^{\frac{9}{2}} = \dfrac{2^n}{\sqrt{2}}$

Find n

.....

(Total for Question 3 is 3 marks)

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34. $2^x = \dfrac{2^n}{\sqrt{2}}$

$2^y = (\sqrt{2})^7$

$x + y = 10$

Find n

.....

(Total for Question 3 is 3 marks)