



Fractional & Negative Indices Exam Practice

Q1. Work out 3^{-2}

Answer: _____
(1 mark)

Q2. Work out $144^{\frac{1}{2}} \div 1^{\frac{1}{2}}$

Answer: _____
(2 mark)



Q3. Work out $(49)^{-\frac{1}{2}}$

Answer: _____
(1 mark)

Q4. Simplify the following expressions:

a) $(16t^6)^{\frac{1}{2}}$

Answer: _____
(2 marks)

b) $\sqrt[3]{27t^{12}}$

Answer: _____
(2 marks)

c) $3x^{-3} \times \frac{1}{6x}$

Answer: _____
(2 marks)



Q5. Find the reciprocal of $\left(\frac{3}{5}\right)^{-1}$

Answer: _____
(1 mark)

Q6. Work out the value of $\left(\frac{8}{125}\right)^{\frac{2}{3}}$

Answer: _____
(2 marks)



Q7. Work out the value of $\left(\frac{1}{27}\right)^{\frac{4}{3}}$

Answer: _____
(2 marks)

Q8. Work out the value of $\left(\frac{9}{4}\right)^{-\frac{3}{2}}$

Answer: _____
(2 marks)



Q9. Find the value of d , given the equation:

$$w^6 \div \sqrt{w^5} = w^d$$

Answer: _____
(2 marks)

Q10. Simplify the expression fully: $\frac{(5a^3)^{\frac{2}{3}} \times 3b^{-4}}{45\sqrt[3]{a^6b^3}}$

Answer: _____
(3 marks)



Q11. Write 32 as a power of 4.

Answer: _____
(2 marks)

Q12. Write the following expression as a power of 5: $\frac{10}{\sqrt{2500}}$

Answer: _____
(2 marks)

Q13. Write the numbers below in order of size, starting with the smallest.
Show any working out which you do.

$$100^{1/3}, \quad 0.2^{-3}, \quad 5^{3/2}, \quad (-1)^{10/3}, \quad 64^{2/3}$$

Answer: _____
(3 marks)



Problem Questions:

Q14. You are given that $5^{-2c} = 0.09$ where c is some non-zero number.
Work out the value of 5^{3c} , giving your answer in the form $\frac{a}{b}$ where
 a and b are integers.

Answer: _____
(3 marks)

Q15. a) Show that the equation $x^{\frac{1}{3}}(15 + 6x^{\frac{1}{3}}) = 9$ can be written in the form,
 $2x^{2/3} + 5x^{1/3} - 3 = 0$

Answer: _____
(1 mark)

b) Hence solve the equation $x^{\frac{1}{3}}(15 + 6x^{\frac{1}{3}}) = 9$ for x .

Answer: _____
(4 marks)



Q16. A scientist is observing a radioactive substance. On the first day, there is N grams of the material. It then decays at a rate such that $\frac{2}{3}$ of its mass is lost each day.

- (i) Find an expression for the amount of the material which is left after 28 days.

Answer: _____
(2 marks)

- (ii) If there was 7kg of material to start with, work out to the nearest gram how much material there is left after 28 days.

Answer: _____
(2 marks)