# Laws Of Indices: Answers

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**Summary**

Answers to supplementary questions for the study guide on Laws Of Indices.

*These are the answers to Laws Of Indices: Questions*

## Q1

Find the following:

1.1. $(3)^4 = 81$

1.2. $125^{\frac{2}{3}} = 5^2 = 25$

1.3. $32^{\frac{2}{5}} = 2^2 = 4$

1.4. $729^{\frac{-2}{3}} = 9^{-2} = \frac{1}{81}$

1.5. $4^3 \cdot 2^5 = 2^6 \cdot 2^5 = 2^{11} = 2048$

1.6. $\frac{9^2}{27^2} = 3^{-2} = \frac{1}{9}$

1.7. $(5^2)^2 = 5^4 = 625$

1.8. $(35^0)^9 = 1$

1.9. $(35^9)^0 = 1$

1.10. $(729^9)^{\frac{1}{9}} = 729^{\frac{9}{9}} = 729$

1.11. $7^{-3} = \frac{1}{343}$

1.12. $64^{\frac{4}{3}} = 4^4 = 256$

## Q2

Simplify the following expressions:

2.1. $(b^7)^4 = b^{28}$

2.2. $y^{13} \cdot y^5 = y^{18}$

2.3. $\frac{x^{13}}{x^5} = x^8$

2.4. $(3y^{-2})^5 = (3)^5 \cdot (y^{-2})^5 = 243y^{-10}$

2.5. $(7z^{-5})^3 = (7)^3 \cdot (z^{-5})^3 = 343z^{-15}$

2.6. $(\frac{8x^5}{4x^{-5}}) = 2x^{(5+5)} = 2x^{10}$

2.7. $((2x)^3 \cdot x^5) = 8x^3 \cdot x^5 = 8x^8$

2.8. $(\frac{2a^{-4}}{(3a)^{-2}}) = (\frac{2}{3^{-2}}) \cdot (a^{-4+2}) = \frac{18}{a^2}$

2.9. $\frac{(2y)^3}{2y^5} = \frac{2^3 \cdot y^3}{2y^5} = 4y^{-2}$

2.10. $(\frac{2}{a})^4 \cdot (\frac{a}{12})^3 = \frac{2^4 \cdot a^3}{a^4 \cdot 12^3} = \frac{16}{1728a} = \frac{1}{108a}$

2.11. $\frac{25t^{-4}}{60t^5} = \frac{5}{12t^9}$

## Q3

Solve for x:

3.1. $629$

3.2. $4$

3.3. $529$

3.4. $\frac{1}{3}$

3.5. $\frac{\ln 10}{3 \ln 2}$

3.6. $-1$

3.7. $\frac{\ln(\frac{49}{64})}{\ln(112)}$

3.8. $\frac{5}{21}$

3.9. $\frac{3-2 \ln 3}{8}$

3.10. $\frac{4-2 \ln 2}{3}$

3.11. $\frac{\ln 129}{4 \ln 2}$

3.12. $\frac{\ln 40}{2}$

3.13. $15$

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