Questions: Laws of indices

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Summary

A selection of questions for the study guide on laws of indices.

*Before attempting these questions, it is highly recommended that you read* [*Guide: Laws of indices*](../studyguides/lawsofindices.qmd)*.*

## Q1

Express each of the following as a single real number.

1.1. $ 3^{4}$

1.2. $ 125^{\frac{2}{3}}$

1.3. $ 32^{\frac{2}{5}}$

1.4. $ 729^{−\frac{2}{3}}$

1.5. $ 4^{3}⋅2^{5}$

1.6. $ 2^{2}⋅3^{2}$

1.7. $ 8^{5}⋅6^{5}$

1.8. $ 12^{6}⋅3^{6}$

1.9. $ \frac{9^{2}}{27^{2}}$

1.10. $ \left(5^{2}\right)^{2}$

1.11. $ \left(35^{0}\right)^{9}$

1.12. $ \left(35^{9}\right)^{0}$

1.13. $ \left(729^{9}\right)^{\frac{1}{9}}$

1.14. $ 7^{−3}$

1.15. $ \frac{4^{5}}{2^{5}}$

1.16. $ \frac{2^{−2}}{13^{−2}}$

1.17. $ 64^{\frac{4}{3}}$

1.18. $ \left(\frac{4^{3}⋅3^{3}}{6^{3}}\right)$

1.19. $ \left(\frac{4^{2}⋅8^{2}}{2^{2}}\right)⋅\left(\frac{1}{2}\right)^{2}$

1.20. $ \frac{\left[\left(\frac{−2}{3}\right)^{−3}⋅\left(\frac{−3}{5}\right)^{−3}\right]}{\left(\frac{2}{3}\right)^{−3}}$

1.21. $ \frac{\left(\frac{1}{2}\right)^{4}\left(\frac{3}{5}\right)^{4}}{\left(\frac{8}{3}\right)^{4}}$

1.22. $ \left(\frac{2}{3}\right)^{14}⋅\left(\frac{9}{12}\right)^{14}$

## Q2

Evaluate the following expressions, writing your answer in the simplest possible form.

2.1. $ \left(b^{7}\right)^{4}$

2.2. $ y^{13}⋅y^{5}$

2.3. $ a^{2}⋅b^{2}$

2.4. $ \frac{x^{13}}{x^{5}}$

2.5. $ \left(y^{−2}\right)^{5}$

2.6. $ a^{−4}⋅b^{−4}$

2.7. $ \left(7z^{−5}\right)^{3}$

2.8. $ \frac{8x^{5}}{4x^{−5}}$

2.9. $ \left(x^{2}\right)^{3}⋅x^{5}$

2.10. $ \frac{2a^{−4}}{3a^{−2}}$

2.11. $ \frac{x^{5}}{y^{5}}$

2.12. $ \frac{2y^{3}}{2y^{5}}$

2.13. $ \left(\frac{2}{a}\right)^{4}⋅\left(\frac{a}{12}\right)^{3}$

2.14. $ \frac{25t^{−4}}{60t^{5}}$

2.15. $ \left(\frac{a}{b}\right)^{−4}⋅\left(\frac{c}{d}\right)^{4}⋅\left(\frac{e}{f}\right)^{4}$

2.16. $ \frac{5^{x+1}⋅6^{x+1}}{3^{x+1}}$

2.17. $ \left(a^{\frac{1}{2}}\right)⋅\left(b^{−\frac{1}{2}}\right)$

2.18. $ \left(\frac{a}{b}\right)^{n}⋅\left(\frac{c}{d}\right)^{−n}$

[After attempting the questions above, please click this link to find the answers.](../answers/as-lawsofindices.qmd).

## Version history and licensing

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* v1.1: edited 05/24 by tdhc.

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