LAWS OF INDICES

Answer all of these questions. Remember to show your working out in all questions.

MAIN QUESTIONS

1.

Simplify $2^3 \times 2^4$

2.

Simplify $5^6 \div 5^2$

3.

Simplify $(3^2)^3$

4.

Simplify 4^0

5.

Simplify 7^{-2}

6.

Simplify 8^(1/3)

7.

Simplify 16^(3/4)

8.

Simplify 9^(-1/2)

9.

Simplify $(2x^3)^4$

10.

Simplify $(3a^2b)^3$

11.

Simplify $(5x^{-2})^2$

12.

Simplify $(2y^3)/(4y^5)$

13.

Simplify $(8x^6)^{(2/3)}$

14.

Simplify $(27a^9)^{(1/3)}$

15.

Simplify $(16x^8)^{(3/4)}$

16.

Simplify $(x^2y^4)^{(1/2)}$

17.

Simplify $(a^{-3}b^2)/(a^2b^{-1})$

18.

Simplify $(4x^{-2}y^3)^2$

19.

Simplify $(9a^4b^{-2})^{(1/2)}$

20.

Simplify $(8x^{-3})^{(2/3)}$

21.

Simplify $(25a^6b^{-4})^{(1/2)}$

22.

Simplify $(x^4y^{-2})^{(3/2)}$

23.

Simplify $(16a^{-8})^{(3/4)}$

24.

Simplify $(27x^{-9})^{(2/3)}$

25.

Simplify $(a^{2}b^{-3}c^{4})/(a^{-1}b^{2}c^{-3})$

26.

Simplify $(8x^{-6}y^{9})^{(2/3)}$

27.

Simplify $(32a^{10}b^{-5})^{(2/5)}$

28.

Simplify $(64x^{-12})^{(1/3)}$

29.

Simplify $(81a^{-8}b^{12})^{(3/4)}$

30.

Simplify $(125x^{-9}y^{6})^{(2/3)}$

MASTER QUESTIONS

M1.

A bacteria culture doubles every hour. If there are 1000 bacteria initially, how many will there be after 6 hours?

M2.

The area of a square is $64cm^{2}$. What is the length of one side?

M3.

A radioactive substance halves every 3 hours. If you start with 800g, how much remains after 12 hours?

M4.

The volume of a cube is $125cm^{3}$. What is the length of one edge?

M5.

A population of rabbits triples every month. If there are 4 rabbits initially, how many will there be after 5 months?

M6.

The surface area of a sphere is proportional to the square of its radius. If a sphere has surface area $144\pi\ cm^{2}$, what is its radius?

M7.

An investment grows by 10% each year. If you invest £1000, what will it be worth after 4 years?

M8.

The intensity of light decreases with the square of the distance from the source. If the intensity is 100 units at 2m, what is it at 5m?

M9.

A car depreciates by 15% each year. If a car is worth £20000 new, what will it be worth after 3 years?

M10.

The period of a pendulum is proportional to the square root of its length. If a 1m pendulum has a period of 2 seconds, what length gives a period of 3 seconds?