hegartymaths

YouTube Live Lessons
Getting ready for A-Level Maths...

"We are what we repeatedly do.

Excellence is not an act, but a habit."

hegartymaths

Laws of indices (4)
Getting ready for A-Level Maths...

What you need...
- Your brain and attention
- A device to watch connected to internet
- A pen and paper
- Can do attitude

Laws of indices (4)

Important rules

$$a^1 = a$$

$$a^0 = 1$$

$$a^m \times a^n = a^{m+n}$$

$$a^m \div a^n = \frac{a^m}{a^n} = a^{m-n}$$

$$(a^m)^n = a^{mn}$$

$$(ka^m)^n = k^n a^{mn}$$

$$a^{-m} = \frac{1}{a^m}$$

$$a^{\frac{1}{m}} = \sqrt[m]{a}$$

$$a^{\frac{n}{m}} = \left(\sqrt[m]{a}\right)^n$$

Laws of indices (4)

My turn

Simplify the following, leaving your answer in index form.

$$\frac{3^{-\frac{6}{5}} \times 3^4 \times 3^{\frac{1}{5}}}{3^7}$$

Your turn

Simplify the following, leaving your answer in index form.

$$\frac{5^{-\frac{1}{4}} \times 5^3 \times 5^{\frac{9}{4}}}{5^8}$$

Laws of indices (4)

My turn

Simplify the following, leaving your answer in index form.

$$\frac{(7^{\frac{4}{5}})^{15} \times (7^2)^{-3}}{(7^{-1})^{-8}}$$

Your turn

Simplify the following, leaving your answer in index form.

$$\frac{(2^{\frac{2}{3}})^{18} \times (2^4)^{-5}}{(2^{-1})^{-2}}$$

Laws of indices (4)

My turn

Simplify fully.
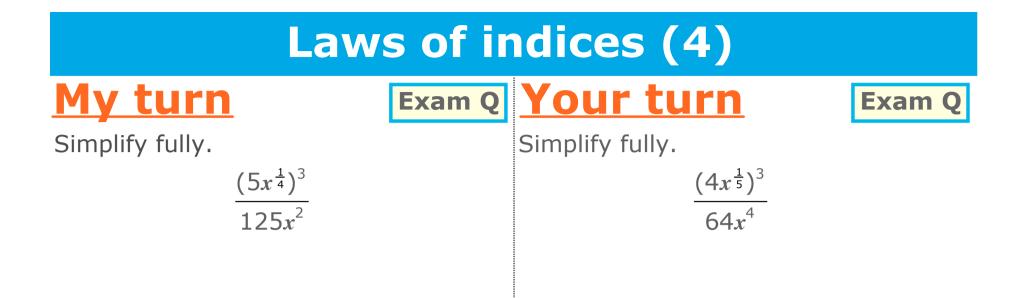
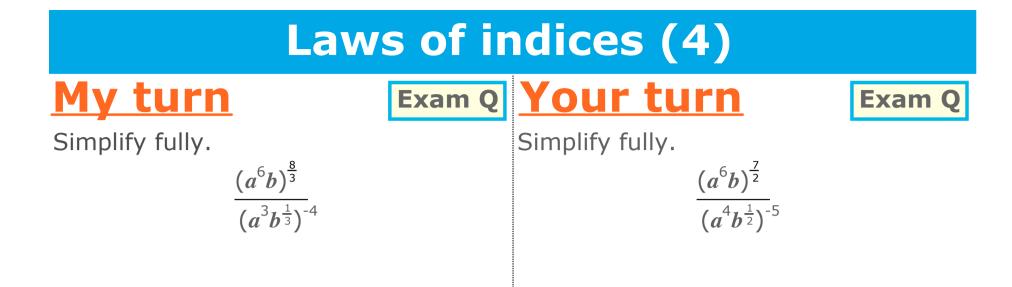$$\frac{15yz^{-\frac{1}{4}}}{3yz^{\frac{3}{4}}}$$

Your turn

Simplify fully.

$$\frac{24y^2z^{-\frac{4}{5}}}{6yz^{\frac{1}{5}}}$$

Laws of indices (4)

My turn

Simplify fully.

$$\frac{(5x^{\frac{1}{4}})^3}{125x^2}$$

Your turn

Simplify fully.

$$\frac{(4x^{\frac{1}{5}})^3}{64x^4}$$

hegartymaths

Laws of indices (4)

My turn

Simplify fully.

$$\frac{(a^6b)^{\frac{8}{3}}}{(a^3b^{\frac{1}{3}})^{-4}}$$

Your turn

Simplify fully.

$$\frac{(a^6b)^{\frac{7}{2}}}{(a^4b^{\frac{1}{2}})^{-5}}$$

hegartymaths

Laws of indices (4)

My turn

Simplify fully.

$$\sqrt{\dfrac{32x^{-5}y^2}{4xy^{-4}}}$$

Your turn

Simplify fully.

$$\sqrt{\dfrac{40x^{-9}y^6}{2xy^{-8}}}$$

Laws of indices (4)

Review Exercise

1. Simplify the following, leaving your answer in index form.

$$\frac{3^{-\frac{13}{6}} \times 3^5 \times 3^{\frac{1}{6}}}{3^8}$$

2. Simplify the following, leaving your answer in index form.

$$\frac{(5^{\frac{7}{2}})^6 \times (5^3)^{-4}}{(5^{-1})^{-12}}$$

3. Simplify fully.

$$\frac{20yz^{-\frac{1}{3}}}{5yz^{\frac{2}{3}}}$$

4. Simplify fully.

$$\frac{(3x^{\frac{1}{3}})^4}{81x^4}$$

5. Simplify fully.

$$\frac{(a^8b)^{\frac{3}{4}}}{(a^2b^{\frac{1}{4}})^{-5}}$$

6. Simplify fully.

$$\sqrt{\frac{48x^{-7}y^2}{4xy^{-8}}}$$

Review Exercise (Answers)

1. Simplify the following, leaving your answer in index form.

$$\frac{3^{-\frac{13}{6}} \times 3^5 \times 3^{\frac{1}{6}}}{3^8}$$

3^{-5}

2. Simplify the following, leaving your answer in index form.

$$\frac{(5^{\frac{7}{2}})^6 \times (5^3)^{-4}}{(5^{-1})^{-12}}$$

5^{-3}

3. Simplify fully.

$$\frac{20yz^{-\frac{1}{3}}}{5yz^{\frac{2}{3}}}$$

$\dfrac{4}{z}$

4. Simplify fully.

$$\frac{(3x^{\frac{1}{3}})^4}{81x^4}$$

$\dfrac{1}{x^{\frac{8}{3}}}$

5. Simplify fully.

$$\frac{(a^8 b)^{\frac{3}{4}}}{(a^2 b^{\frac{1}{4}})^{-5}}$$

$a^{18} b^2$

6. Simplify fully.

$$\sqrt{\frac{48x^{-7}y^2}{4xy^{-8}}}$$

$\dfrac{2\sqrt{3}y^5}{x^4}$

hegartymaths