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 (3)

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 (3)

Important rules

$$a^1 = a$$

$$a^0 = 1$$

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

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

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

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

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

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

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

Laws of indices (3)

My turn

Evaluate the following.

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

Your turn

Evaluate the following.

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

Laws of indices (3)

My turn

Simplify the following, leaving your answer in index form.

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

Your turn

Simplify the following, leaving your answer in index form.

$$5^{-\frac{1}{3}} \times 5^{2} \times 5^{\frac{8}{3}}$$

Laws of indices (3)

My turn

Simplify fully.

$$a^{\frac{2}{3}}b^{\frac{2}{5}} \times a^{\frac{4}{3}}b^{\frac{-12}{5}}$$

Your turn

Simplify fully.

$$a^{\frac{9}{2}}b^{\frac{3}{4}} \times a^{\frac{7}{2}}b^{\frac{-27}{4}}$$

Laws of indices (3)

My turn

Exam Q

Simplify fully.

$\sqrt[3]{a^4} \times \sqrt[3]{27a^2}$

Your turn

Exam Q

Simplify fully.

$\sqrt{a^5} \times \sqrt{36a}$

Laws of indices (3)

My turn

Exam Q

Simplify fully.

$$\sqrt{a^{\frac{2}{3}} \times a^{\frac{2}{7}}}$$

Your turn

Exam Q

Simplify fully.

$$\sqrt[3]{a^{\frac{3}{4}} \times a^{\frac{3}{5}}}$$

Laws of indices (3)

Review Exercise

1. Evaluate the following.

$2^{-\frac{1}{4}} \times 2^{5} \times 2^{\frac{13}{4}}$

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

$2^{-\frac{1}{3}} \times 2^{4} \times 2^{\frac{11}{3}}$

3. Simplify fully.

$a^{\frac{3}{4}} b^{\frac{2}{3}} \times a^{\frac{5}{4}} b^{\frac{-14}{3}}$

4. Simplify fully.

$\sqrt[4]{a^{7}} \times \sqrt[4]{625a^{5}}$

5. Simplify fully.

$\sqrt[4]{a^{\frac{4}{5}} \times a^{\frac{4}{7}}}$

Laws of indices (3)

Review Exercise (Answers)

1. Evaluate the following.

$2^{-\frac{1}{4}} \times 2^{5} \times 2^{\frac{13}{4}}$

256

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

$2^{-\frac{1}{3}} \times 2^{4} \times 2^{\frac{11}{3}}$

$2^{\frac{22}{3}}$

3. Simplify fully.

$a^{\frac{3}{4}}b^{\frac{2}{3}} \times a^{\frac{5}{4}}b^{\frac{-14}{3}}$

$a^{2}b^{-4}$

4. Simplify fully.

$\sqrt[4]{a^{7}} \times \sqrt[4]{625a^{5}}$

$5a^{3}$

5. Simplify fully.

$\sqrt[4]{a^{\frac{4}{5}} \times a^{\frac{4}{7}}}$

$a^{\frac{12}{35}}$