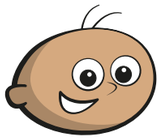
Using the addition and subtraction law for indices

1



2^8 divided by 2^5 is 2^3

a) Cancel the common factors in this division to show that Tommy is correct.

$$\frac{2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2}{2 \times 2 \times 2 \times 2 \times 2}$$

b)

$2^8 = 256$	$2^5 = 32$

Work out 256 divided by 32 ☐

Explain your method.

2 Complete the calculations by filling in the missing values.

a) $\frac{3^5}{3^3} = \frac{3 \times 3 \times 3 \times 3 \times 3}{\square} = 3^{\square}$

b) $\frac{5^6}{5^3} = \frac{\square}{\square} = \square$

c) $\frac{7^{10}}{7^4} = \frac{\square}{\square} = \square$

3 Complete the expressions by filling in the missing values.

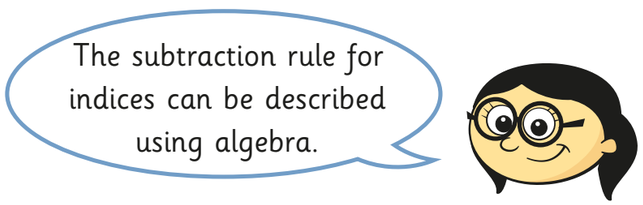
a) $\frac{k^5}{k^3} = \frac{k \times k \times k \times k \times k}{\square} = k^{\square}$

b) $\frac{m^6}{m^4} = \frac{\square}{\square} = \_\_\_\_\_$

c) $\frac{t^{12}}{t^5} = \frac{\square}{\square} = \_\_\_\_\_$

What patterns do you notice?

4



Complete the statement.

The subtraction rule for indices is $x^m \div x^n \equiv$ _____

Describe the rule in your own words.

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5 Simplify the expressions, giving each answer as a single term.

a) $2^{14} \div 2^6 =$ _____

b) $a^9 \div a^5 \equiv$ _____

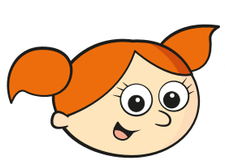
c) $t^6 \div t^2 \equiv$ _____

d) $p^8 \div p^2 \equiv$ _____

e) $y^8 \div y^4 \equiv$ _____

f) $3k^7 \div k^4 \equiv$ _____

6 **a)**



$t^4 \div t = 4$ because the ts cancel out.

Discuss with a partner why Alex is wrong.

What is the correct answer? _____

b) Simplify the expressions.

$2^7 \div 2 \equiv$ _____ $a^9 \div a \equiv$ _____ $t^6 \div t \equiv$ _____

7 Complete the statements.

a) $(4^3 \times 4^5) \div 4^2 = 4^{\square} \div 4^2$

$= 4^{\square}$

b) $(t^5 \times t^{10}) \div (t^6 \times t^7) \equiv t^{\square} \div t^{\square}$

$\equiv t^{\square}$

c) $(m^8 \times m^4) \div (m^7 \times m^5) \equiv m^{\square} \div m^{\square}$

$\equiv m^{\square}$

8 Fill in the correct operation for each statement.

a) $4^5 \bigcirc 4^7 = 4^{12}$

b) $7^6 \bigcirc 7^4 = 7^2$

c) $t^2 \bigcirc t^6 = t^{12} \bigcirc t^4$

d) $h^4 \bigcirc h^3 = h^{10} \bigcirc h^9$

9 Add brackets to make the statements true.

a) $9^8 \div 9^3 \times 9^2 = 9^3$

b) $6^5 \div 6^2 \times 6^3 \times 6^5 = 6^5$

c) $a^4 \times a^7 \div a^8 \times a^2 \equiv a$

d) $f^{10} \div f^3 \div f^{12} \div f^8 \equiv f^3$

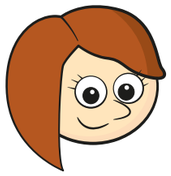
10 Rearrange the cards to make a correct statement.

3^5		3^3		3^9		3^7
	×		=		÷	

Compare answers with a partner.

11 Rosie and Teddy are looking at the same question.

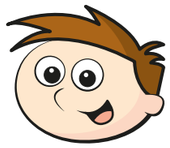
Work out $5^2 \div 5^2$



Rosie

I think the answer is 1, because if you divide a number by itself you always get the number 1

I think the answer is 5^0, because when you use the subtraction rule for indices, you subtract the powers.



Teddy

Who is correct? Circle your answer.

Teddy **Rosie** **both** **neither**

Explain your answer.

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