Learning Intention:

WALT identify the base number and the index number. Expand and simplify indices. Success Criteria: I know what is a base number. How do the powers work? I can expand 54 As a multiple of a base number.

Video

$5x5x5x5x5x5 = 5^6$

The base is multiplied by 6 times, therefore, the index is 6

EXAMPLE 1

- a Write $5 \times 5 \times 5 \times 5 \times 5 \times 5$ in index form.
- b Write the answer for part a in words.
- c State which number is the base and which is the index.
- **a** 5 is repeated 6 times. $\therefore 5 \times 5 \times 5 \times 5 \times 5 \times 5 = 5^6$
- b 56 means '5 to the power of 6'.
- c The base is 5 and the index is 6.

Exercise 4A

- Complete the following.
 - a Write $2 \times 2 \times 2 \times 2 \times 2$ in index form.

 $2 \times 2 \times 2 \times 2 \times 2 = 2^{\square}$

b Write the answer from part a in words.

_ means '___ to the power of _

c State which number is the base and which is the index.

The base is ____ and the index is __

- 2 a Write $7 \times 7 \times 7 \times 7 \times 7 \times 7 \times 7 \times 7$ in index form.
 - b Write the answer from part a in words.
 - c State which number is the base and which is the index.
- 3 a Write the following in index form.

 $i 4 \times 4 \times 4$

- b Write the answer from part a in words.
- c State which number is the base and which is the power.
- 4 a Write the following in index form.

 $i 6 \times 6 \times 6 \times 6 \times 6 \times 6$

ii $10 \times 10 \times 10 \times 10$

- **b** Write the answer from part **a** in words.
- c State which number is the base and which is the exponent.
- 5 Write the following products in index form.

a 8×8×8×8×8×8×8×8

b 10 × 10 × 10

c 12 × 12

d $6 \times 6 \times 6 \times 6$

e 9×9×9×9×9×9×9

Index, power and exponent all mean the same thing.

Now working with the variables **Indices** practice

Try some other stuff

EXAMPLE 2 a Write $p \times p \times p \times p$ in index form. b Write the answer for part a in words. c State which part is the base and which is the index. a p is repeated 4 times. ∴ p × p × p × p = p⁴ b p⁴ means p to the power of 4. c The base is p and the index is 4. 6 Complete the following. Write k × k × k × k in index form. $k \times k \times k \times k \times k = k^{\square}$ b Write the answer from part a in words. ____ means '___ to the power of __ c State which number is the base and which is the index. The base is ____ and the index is ____ 7 a Write the following in index form. $i w \times w \times w \times w$ b Write the answer for part a in words. c State which part is the base and which is the index. EXAMPLE 3 Write the following in expanded form. Expanded form means as a repeated product. a Base is 4 and index is 3. ... 4 is written out 3 times. 4^3 in expanded form is $4 \times 4 \times 4$. b Base is h and index is 5. ... h is written out 5 times. h^5 in expanded form is $h \times h \times h \times h \times h$. 8 Complete to write the following in expanded form. a 56 = ___ × ___ × ___ × ___ × ___ × ___ × ___ b 123 = ___ × ___ × ___ c j5 = ___ × ___ × ___ × ___ × ___ d ν⁷ = ___ × ___ × ___ × ___ × ___ × ___ × 9 Write the following in expanded form. a 16 b 78 c 63 g 8⁵ k f⁴ f 32 h 45 e 10² i 17 j t2 m y⁵ n d⁶ o k³

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