Exercises
INDICES

Question 1

Simplify:

$$2^3 \times 2^5$$

Answer:

$$2^{3+5} = 2^8 = 256$$

Question 2

Simplify:

$$\frac{5^7}{5^3}$$

Answer:

$$5^{7-3} = 5^4 = 625$$

Question 3

Simplify:

$$(3^2)^4$$

Answer:

$$3^{2\times4} = 3^8 = 6561$$

Exercises
INDICES

Question 4

Evaluate:

$$\left(\frac{8}{27}\right)^{-\frac{2}{3}}$$

Answer:

$$\left(\frac{8}{27}\right)^{-\frac{2}{3}} = \left(\frac{27}{8}\right)^{\frac{2}{3}} = \left(\frac{3^3}{2^3}\right)^{\frac{2}{3}} = \left(\frac{3}{2}\right)^2 = \frac{9}{4}$$

Question 5

Solve for x:

$$2^{x+1} = 16$$

Answer:

$$16 = 2^4 \Rightarrow 2^{x+1} = 2^4 \Rightarrow x + 1 = 4 \Rightarrow x = 3$$

Exercises
EQUATION OF INDICES

Question 1

Solve for x:

$$2^x = 16$$

Solution:

$$16 = 2^4 \Rightarrow 2^x = 2^4 \Rightarrow x = 4$$

✅ Answer: $x = 4$

Question 2

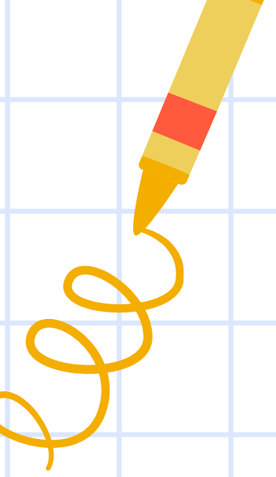
Solve for x:

$$5^x = 125$$

Solution:

$$125 = 5^3 \Rightarrow 5^x = 5^3 \Rightarrow x = 3$$

✅ Answer: $x = 3$



Exercises
EQUATION OF INDICES

Question 3

Solve for x:

$$3^{x+1} = 27$$

Solution:

$$27 = 3^3 \Rightarrow 3^{x+1} = 3^3$$

$$x + 1 = 3 \Rightarrow x = 2$$

✅ Answer: $x = 2$

Question 4

Solve for x:

$$2^{x-1} = 8$$

Solution:

$$8 = 2^3 \Rightarrow 2^{x-1} = 2^3$$

$$x - 1 = 3 \Rightarrow x = 4$$

✅ Answer: $x = 4$

Exercises
EQUATION OF INDICES

Question 5

Solve for x:

$$9^x = 27$$

Solution:

Write both with base 3:

$$(3^2)^x = 3^3 \Rightarrow 3^{2x} = 3^3$$

$$2x = 3 \Rightarrow x = \frac{3}{2}$$

✅ Answer: $x = \frac{3}{2}$

Question 6

Solve for x:

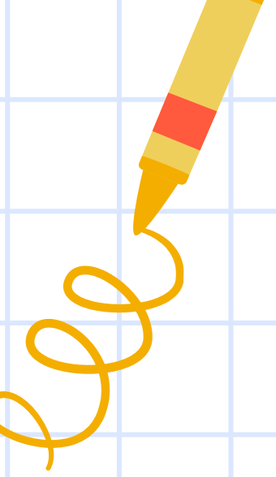
$$4^x = 8$$

Solution:

$$(2^2)^x = 2^3 \Rightarrow 2^{2x} = 2^3$$

$$2x = 3 \Rightarrow x = \frac{3}{2}$$

✅ Answer: $x = 1.5$



Exercises
EQUATION OF INDICES

Question 7

Solve for x:

$$5^{2x-1} = 25$$

Solution:

$$25 = 5^2 \Rightarrow 5^{2x-1} = 5^2$$

$$2x - 1 = 2 \Rightarrow 2x = 3 \Rightarrow x = \frac{3}{2}$$

✅ Answer: $x = 1.5$

Question 8

Solve for x:

$$3^{2x} = 27$$

Solution:

$$27 = 3^3 \Rightarrow 3^{2x} = 3^3$$

$$2x = 3 \Rightarrow x = \frac{3}{2}$$

✅ Answer: $x = 1.5$

Exercises
EQUATION OF INDICES

Question 9

Solve for x:

$$2^{x+1} = 32$$

Solution:

$$32 = 2^5 \Rightarrow 2^{x+1} = 2^5$$

$$x + 1 = 5 \Rightarrow x = 4$$

Answer: $x = 4$

Question 10

Solve for x:

$$3^{x+2} = 81$$

Solution:

$$81 = 3^4 \Rightarrow 3^{x+2} = 3^4$$

$$x + 2 = 4 \Rightarrow x = 2$$

Answer: $x = 2$