



ACHIEVE ACADEMY

GCSE Maths — Higher Tier

Factors, Multiples, Primes & Indices · Practice Booklet

NAME: _____

CLASS: _____

DATE: _____

☐ Developing

☒ Secure

☐ Greater Depth

Answer every question in the working space provided. Method marks are available for correct working even if the final answer is wrong. Check the time allowed with your tutor before you start.

Factors, Multiples, Primes & Indices

Total marks available: 100

● Factors, Multiples, Primes & Indices

Q1

[3 marks]

Calculate $16^{1/2}$.

Q2

[3 marks]

Simplify $(3^2)^2$. Give your answer in index form.

Q3

[3 marks]

Simplify $(2^5 \times 2^2) \div 2^4$. Give your answer in index form.

Q4

[3 marks]

Calculate $27^{2/3}$.

Q5

[3 marks]

Calculate $64^{1/3}$.

Q6

[3 marks]

Simplify $(2^4)^2$. Give your answer in index form.

Q7

[3 marks]

Simplify $(2^3 \times 2^3) \div 2^4$. Give your answer in index form.

Q8

[3 marks]

Simplify $(3^8 \times 3^2) \div 3^4$. Give your answer in index form.

Q9

[3 marks]

Calculate $4^{3/2}$.

Q10

[3 marks]

Simplify $(3^2)^4$. Give your answer in index form.

Q11

[3 marks]

Simplify $3 \times 3^3 \times 4 \times 3^2$. Give your answer in the form $k \times 3^n$.

Q12

[3 marks]

A shop has 40 red pens and 32 blue pens. They are packed into identical bags, each with the same number of pens of each colour, using as few bags as possible. How many pens of each colour are in each bag?

Q13

[3 marks]

Simplify $4 \times 2^2 \times 4 \times 2^3$. Give your answer in the form $k \times 2^n$.

Q14

[3 marks]

Simplify $4 \times 2^3 \times 3 \times 2^3$. Give your answer in the form $k \times 2^n$.

Q15

[3 marks]

Simplify $4 \times 5^4 \times 3 \times 5^2$. Give your answer in the form $k \times 5^n$.

Q16

[3 marks]

Simplify $3 \times 3^4 \times 2 \times 3^1$. Give your answer in the form $k \times 3^n$.

Q17

[3 marks]

Simplify $4 \times 5^5 \times 4 \times 5^3$. Give your answer in the form $k \times 5^n$.

Q18

[3 marks]

A shop has 42 red pens and 60 blue pens. They are packed into identical bags, each with the same number of pens of each colour, using as few bags as possible. How many pens of each colour are in each bag?

Q19

[3 marks]

Simplify $2 \times 2^2 \times 2 \times 2^1$. Give your answer in the form $k \times 2^n$.

Q20

[3 marks]

Simplify $4 \times 3^4 \times 3 \times 3^4$. Give your answer in the form $k \times 3^n$.

Q21

[4 marks]

Calculate $8^{-2/3}$. Give your answer as a fraction.

Q22

[4 marks]

Calculate $4^{-1/2}$. Give your answer as a fraction.

Q23

[4 marks]

$A = 7^2 \times 5^3$ and $B = 7^1 \times 5^3$. Find the LCM of A and B, giving your answer as a product of prime factors.

Q24

[4 marks]

Calculate $27^{-1/3}$. Give your answer as a fraction.

Q25

[4 marks]

$A = 3^2 \times 5^1$ and $B = 3^3 \times 5^1$. Find the LCM of A and B, giving your answer as a product of prime factors.

Q26

[4 marks]

$A = 2^3 \times 7^3$ and $B = 2^1 \times 7^2$. Find the LCM of A and B, giving your answer as a product of prime factors.

Q27

[4 marks]

Calculate $27^{-2/3}$. Give your answer as a fraction.

Q28

[4 marks]

$A = 2^2 \times 7^1$ and $B = 2^2 \times 7^1$. Find the HCF of A and B, giving your answer as a product of prime factors.

Q29

[4 marks]

$A = 3^3 \times 7^2$ and $B = 3^1 \times 7^2$. Find the HCF of A and B, giving your answer as a product of prime factors.

Q30

[4 marks]

Calculate $16^{-1/2}$. Give your answer as a fraction.