

OCR 01 Number Operations and Integers (Foundation)

- Find the cube root of 216.
- Find the Lowest Common Multiple of 6 and 15.
- Fill in the missing value.

$$86 \times 15 = 30 \times \boxed{}$$

- Put one or more pairs of brackets in the following statement to make it true.

$$15 - 2 \times 8 - 5 = 39$$

- List the prime numbers between 70 and 80.
- From the numbers below, identify a factor of 144 that is odd.

2 5 7 8 9 11 12

- Write 576 as a product of its prime factors.
- Calculate $4^3 \div (17 - 3 \times 3) - 10$.
- Calculate $\left(\frac{-10 \times -7}{35}\right)^3$.
- Find the Highest Common Factor and the Lowest Common Multiple of 70 and 175.
- Kerri thinks of a number, doubles it and then squares the result before subtracting 7 to get her final value. If she then takes her final value, list the order of operations necessary to get back to her original starting value.
- Jason says that the numbers 1 and 64 are both square numbers and cube numbers. Is he correct? Explain your answer.
- Ted tries to find the Highest Common Factor (HCF) of 360 and 540 and writes down the following.

$$\begin{aligned} 540 &= 2^2 \times 3^3 \times 5 \\ 360 &= 2^3 \times 3^2 \times 5 \\ \text{HCF} &= 2^3 \times 3^3 \times 5 = 1080. \end{aligned}$$

Explain what he has done wrong.

14. By using just one pair of brackets, the following can be made true.

$$5^2 - 4 \div 3 = \sqrt{100} \div 5 + 5$$

Show the location of the brackets and give the numeric value of each side of the expression when true.

15. Sam claims that the product of any two consecutive prime numbers is always an odd number. Find an example to show that Sam is not correct.
16. Roelof has 6000 oranges he would like to share equally between himself, his partner and three-hundred students. While doing this, he finds that 262 of his oranges are bad and so disposes of these. How many oranges does each person receive?
17. Berni thinks of a number. She squares this number and then subtracts 12. Her answer is 37. What was the original number she thought of?
18. The area of a square is 121 cm^2 . Calculate the perimeter of the square.
19. The product of three different prime numbers is 110. What is the sum of these three prime numbers?
20. Three times a number gives the same answer as adding 22 to the number. What is the number?

Answers

1. 6

2. 30

3. 43

4. $(15 - 2) \times (8 - 5) = 39$

5. 71, 73 and 79

6. 9

$$\begin{aligned}
 7. \quad 576 &= 2 \times 288 \\
 &= 2 \times 2 \times 144 \\
 &= 2 \times 2 \times 2 \times 72 \\
 &= 2 \times 2 \times 2 \times 2 \times 36 \\
 &= 2 \times 2 \times 2 \times 2 \times 2 \times 18 \\
 &= 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 9 \\
 &= 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \\
 &= 2^6 \times 3^2
 \end{aligned}$$

8. -2

9. $\left(\frac{70}{35}\right)^3 = 2^3 = 2 \times 2 \times 2 = 8$

10. HCF = 35 and LCM = 350

11. Kerri would need to add 7 to her final value then take the square root of the result before halving that outcome to reach her original starting value.

12. Jason is correct as $1 \times 1 = 1$ and $1 \times 1 \times 1 = 1$. Also $8 \times 8 = 64$ and $4 \times 4 \times 4 = 64$.

13. Ted has found the correct prime factors for 540 and for 360. By selecting the highest power of each prime factor to calculate his answer, he has actually found the Least Common Multiple (LCM) of the two numbers. (He should have used the highest *common* power of each prime factor to get $\text{HCF} = 2^2 \times 3^2 \times 5 = 180$ as his answer.)

14. $(5^2 - 4) \div 3 = \sqrt{100} \div 5 + 5 = 7$

15. 2 and 3 are consecutive prime numbers. $2 \times 3 = 6$ which is an even number so Sam is not correct.

16. $(6000 - 262) \div (1 + 1 + 300) = 5738 \div 302 = 19$ oranges

$$\begin{aligned}
 17. \quad x^2 - 12 &= 37 \\
 x^2 &= 49 \\
 x &= 7 \text{ or } -7
 \end{aligned}$$

18. Length of side of square = $\sqrt{121} = 11$ cm.
Perimeter = $4 \times 11 = 44$ cm.

19. $2 \times 5 \times 11 = 110$, sum = $2 + 5 + 11 = 18$

20. $3 \times N = N + 22$
 $3 \times N - N = 22$
 $2 \times N = 22$
 $N = 22 \div 2 = 11$

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Assessment Objective	Qu.	Topic	R	A	G
AO1	1	Find the cube root			
AO1	2	Find the LCM			
AO1	3	Use inverse operations			
AO1	4	Perform calculations involving brackets			
AO1	5	Identify prime numbers			
AO1	6	Identify a factor which is also an odd number			
AO1	7	Express a number as a product of its prime factors using powers			
AO1	8	Perform calculations using priority of operations			
AO1	9	Perform calculations using brackets, powers and negative numbers			
AO1	10	Find the HCF and LCM of two whole numbers			
AO2	11	Write down inverse operations			
AO2	12	Understand and explain square numbers and cube numbers			
AO2	13	Interpret a calculation			
AO2	14	Use order of operations			
AO2	15	Interpret number facts			
AO3	16	Solve a problem using priority of operations			
AO3	17	Solve a problem using priority of operations and inverse operations			
AO3	18	Solve a problem using square root			
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