Factor/divisibility algorithms

6 questions | 13 marks

Equivalent correct methods earn the corresponding marks.

1. Use a factor-pair procedure to find all factor pairs of 16. [2 marks]

Test one through four. Include the equal-factor pair.

Answer: 1×16, 2×8 and 4×4.

2. For a target of 28, what is the largest candidate tested using the square stopping rule? [2 marks]

$5 \times 5 = 25$ is not greater than twenty-eight.

$6 \times 6 = 36$ is greater, so stop before six.

Answer: 5.

3. A learner records 1×24, 2×12 and 4×6, but misses one pair. Which candidate was skipped? [2 marks]

$3 \times 8 = 24$, so the missing pair is three and eight.

Answer: 3.

4. Follow the two-decision test for six on the number 123. State where the procedure stops. [2 marks]

123 is odd, so there is no need for the second check.

Answer: It stops at the even-number test: 123 is not divisible by six.

5. Test the procedure on 25. Explain why 5×5 appears once rather than twice. [2 marks]

Test one through five.

Five multiplied by itself gives twenty-five; it is a valid pair.

Answer: The pairs are 1×25 and 5×5. The equal pair has no different reversed arrangement.

6. Design a short decision rule for divisibility by 10, then use it on 240 and 245. [3 marks]

The final digit is enough for this divisor.

State both possible outcomes so the rule is complete.

Answer: Check the final digit. If it is zero, divisible by ten; otherwise not. 240 passes and 245 fails.