Review of primitive roots

We will review a some points about primitive roots from before break.

Question 1 For a prime p , a primitive root there exists modulo p .
Multiple Choice:
(a) Always ✓
(b) Sometimes
(c) Never
Question 2 If $n = pq$ where p and q are distinct primes, then there exists a primitive root modulo n .
Multiple Choice:
(a) Always
(b) Sometimes
(c) Never ✓
Question 3 If $n = 2^k$ and $k \ge 3$, then there exists a primitive root modulo n .
Multiple Choice:
(a) Always
(b) Sometimes

Learning outcomes:

Author(s):

(c) Never ✓

Question 4 If n = km where k and m are relatively prime and greater than 2, then there exists a primitive root modulo n.

Multiple Choice:

- (a) Always
- (b) Sometimes
- (c) Never ✓

Question 5 There exists primitive roots modulo n when for n =

Select All Correct Answers:

- (a) 1 ✓
- (b) p a prime \checkmark
- (c) 4 ✓
- (d) 2^m for $m \ge 3$
- (e) p^m for p an odd prime \checkmark
- (f) $2p^m$ for p an odd prime \checkmark
- (g) n a composite number with at least two distinct odd prime factors