PRINTABLE VERSION

Quiz 10

You scored 100 out of 100

Question 1

Your answer is CORRECT.

Use the "Division Algorithm" to compute $2 \div 1$, and then determine which of the following statements is true.

a) The value of the quotient is $q = 2$ and the value of the remainder is $r = 0$.

b) The value of the quotient is $q = 1$ and the value of the remainder is $r = 2$.

c) The value of the quotient is $q = 2$ and the value of the remainder is $r = 1$.

d) The value of the quotient is $q = 2$ and there are two possible remainder values $r = 0$ and $r = 1$.

e) The value of the quotient is $q = 0$ and the value of the remainder is $r = 2$.

Question 2

Your answer is CORRECT.

A mathematician used the division algorithm to divide the number 17 by another number b. Their computation resulted in the facts that the quotient $q = 8$ and the remainder $r = 3$. Determine the value of b.

a) $b = 17$

b) $b = 2$

c) There must have been a mistake, as there is no value of b that makes this possible.

d) $b = 139$

e) $b = 1$

Question 3

Your answer is CORRECT.

What are the possible values for the remainder r when using the Division Algorithm to divide an integer a by the number 17?

a) The remainder r can take on any integer value.

b) $r \in \{-17, -16, \cdots, -2, -1, 0, 1, 2, \cdots, 16, 17\}$

c) There is only one unique value for r, and that is $r = 7$.

d) $r \in \{0, 1, 2, \cdots, 16\}$

e) $r \in \{0, 1, 2, \cdots, 16, 17\}$

Question 4

Your answer is CORRECT.

A mathematician used the division algorithm to divide an integer a by the number 8. Their computation resulted in the facts that the quotient $q = 18$ and the remainder $r = 0$. Determine the value of a.

a) $a = 136$

b) $a = 144$

c) $a = 8$

d) There must have been a mistake, as there is no value of a that makes this possible.

e) $a = \frac{4}{9}$

Question 5

Your answer is CORRECT.

The Fundamental Theorem of Arithmetic states

a) Every integer greater than 1 is a prime.

b) Every prime greater than 1 can be expressed as a product of integers.

c) Every integer greater than 1 can be uniquely expressed as a product of prime numbers (up to the order of the factors).

d) Every integer greater than 1 can be expressed as a product of prime numbers.

e) Every prime greater than 1 can be uniquely expressed as a product of integers.

Question 6

Your answer is CORRECT.

What is the remainder when the Division Algorithm is used to divide 13 by 7?

a) The remainder is $r = 6$.

b) The remainder is $r = \frac{6}{7}$.

c) The remainder is $r = \frac{13}{7}$.

d) The remainder is $r = 7$.

e) The remainder is $r = 13$.

Question 7

Your answer is CORRECT.

A mathematician used the division algorithm to divide an integer a by the number 8, and they found that the remainder $r = 3$. Based on this information determine which of the following statements is true.

a) a is a multiple of 8.

b) $a \in \{8m + 3 : m \in Z\}$

c) a is a multiple of 11.

d) The only possible value of a is $a = 11$.

Question 8

Your answer is CORRECT.

The statement $\gcd(80, 61) = 8$ is false. Which of the following best explains *why* ?

a) 8 is a common divisor for both 80 and 61, but it is not the greatest one.

b) 8 is not a common divisor. $8|80$, but $8 \nmid 61$.

c) 8 is not a common divisor. $8|61$, but $8 \nmid 80$.

d) The statement is false because the $\gcd(80, 61) = 4880$

e) The statement is false because the $\gcd(80, 61) = 80$.

Question 9

Your answer is CORRECT.

Of the options provided below, which pair of numbers is **relatively prime**?

a) $19, 38$

b) $19, 12$

c) $77, 49$

d) $12, 36$

e) None of these pairs are relatively prime.

Question 10

Your answer is CORRECT.

Recall Bezout's Identity:

$$\forall\, a, b \in Z,\ \exists x, y \in Z,\ ax + by = \gcd(a, b)$$

If we apply this identity to the pair of integers $a = 3$ and $b = 5$ we produce the statement

$$\exists\, x, y \in Z,\ 3x + 5y = \gcd(3, 5).$$

Of the options provided, which values can we use for x and y to show this statement is true? Are there *other or additional values* one can use for x and y?

a) There are no solutions to this equation. Bezout's Identity does not apply because the two integers are relatively prime.

b) $x = 32$ and $y = -19$, and *yes* there are other solutions!

c) $x = 30$ and $y = -15$, and *yes* there are other solutions!

d) $x = 32$ and $y = -19$, and this pair is the only *unique* solution!

e) $x = 30$ and $y = -15$, and this pair is the only *unique* solution!