PRINTABLE VERSION

Quiz 10

You scored 100 out of 100

Question 1

Your answer is CORRECT.

Use the "Division Algorithm" to compute $32 \div 14$, and then determine which of the following statements is true.

a) ○ The value of the quotient is $q = 14$ and the value of the remainder is $r = 32$.

b) ○ The value of the quotient is $q = 2$ and there are two possible remainder values $r = 4$ and $r = 18$.

c) ○ The value of the quotient is $q = 32$ and the value of the remainder is $r = 14$.

d) ○ The value of the quotient is $q = 4$ and the value of the remainder is $r = 2$.

e) ◉ The value of the quotient is $q = 2$ and the value of the remainder is $r = 4$.

Question 2

Your answer is CORRECT.

A mathematician used the division algorithm to divide the number 15 by another number b. Their computation resulted in the facts that the quotient $q = 3$ and the remainder $r = 3$. Determine the value of b.

a) ◉ $b = 4$

b) ○ $b = 16$

c) ○ $b = 15$

d) ○ $b = 48$

e) ○ $b = 3$

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 24?

a) There is only one unique value for r, and that is $r = 5$.

b) $r \in \{-24, -23, \cdots, -2, -1, 0, 1, 2, \cdots, 23, 24\}$

c) $r \in \{0, 1, 2, \cdots, 23, 24\}$

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

e) $r \in \{0, 1, 2, \cdots, 23\}$

Question 4

Your answer is CORRECT.

A mathematician used the division algorithm to divide an integer a by the number 11. Their computation resulted in the facts that the quotient $q = 5$ and the remainder $r = 10$. Determine the value of a.

a) $a = 65$

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

c) $a = 11$

d) $a = 105$

e) $a = \frac{1}{5}$

Question 5

Your answer is CORRECT.

The Fundamental Theorem of Arithmetic states

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

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

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

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

e) Every integer greater than 1 is a prime.

Question 6

Your answer is CORRECT.

What is the remainder when the Division Algorithm is used to divide 9 by 6?

a) The remainder is $r = \frac{3}{2}$.

b) The remainder is $r = 6$.

c) The remainder is $r = \frac{1}{2}$.

d) The remainder is $r = 3$.

e) The remainder is $r = 9$.

Question 7

Your answer is CORRECT.

A mathematician used the division algorithm to divide an integer a by the number 18, and they found that the remainder $r = 15$. Based on this information determine which of the following statements is true.

a) The only possible value of a is $a = 33$.

b) $a \in \{18m : m \in Z\}$

c) $a - 15$ is a multiple of 18.

d) a is a multiple of 33.

Question 8

Your answer is CORRECT.

The statement $\gcd(84, 68) = 2$ is false. Which of the following best explains *why* ?

a) 2 is not a common divisor. $2|68$, but $2 \not| \ 84$.

b) 2 is a common divisor for both 84 and 68, but it is not the greatest one.

c) Wait a minute.. 2 *is* the greatest common divisor for 84 and 68. This statement is true!

d) The statement is false because the $\gcd(84, 68) = 1428$

e) The statement is false because the $\gcd(84, 68) = 84$.

Question 9

Your answer is CORRECT.

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

a) $49, 38$

b) $38, 76$

c) None of these pairs are relatively prime.

d) $35, 25$

e) $49, 49$

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 $a = 4$ and $b = 21$ we produce the statement

$$\exists\, x, y \in Z,\ 4x + 21y = \gcd(4, 21).$$

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) $x = 16$ and $y = -3$, and *yes* there are other solutions!

b) $x = 21$ and $y = 0$, and this pair is the only *unique* solution!

c) $x = 16$ and $y = -3$, and this pair is the only *unique* solution!

d) $x = 21$ and $y = 0$, and *yes* there are other solutions!

e) There are no solutions to this equation. Bezout's Identity does not apply because the integers a and b are too big..