PRINTABLE VERSION

Quiz 10

You scored 60 out of 100

Question 1

Your answer is CORRECT.

Use the "Division Algorithm" to compute $26 \div 22$, and then determine which of the following statements is true.

a) The value of the quotient is $q = 26$ and the value of the remainder is $r = 22$.

b) The value of the quotient is $q = 1$ and the value of the remainder is $r = 4$.

c) The value of the quotient is $q = 1$ and there are two possible remainder values $r = 4$ and $r = 26$.

d) The value of the quotient is $q = 4$ and the value of the remainder is $r = 1$.

e) The value of the quotient is $q = 22$ and the value of the remainder is $r = 26$.

Question 2

Your answer is INCORRECT.

A mathematician used the division algorithm to divide the number 28 by another number b. Their computation resulted in the facts that the quotient $q = 1$ and the remainder $r = 20$. Determine the value of b.

a) $b = 28$

b) $b = 48$

c) $b = 18$

d) $b = 10$

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

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 48?

a) $r \in \{0, 1, 2, \cdots, 47, 48\}$

b) $r \in \{-48, -47, \cdots, -2, -1, 0, 1, 2, \cdots, 47, 48\}$

c) $r \in \{0, 1, 2, \cdots, 47\}$

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

e) There is only one unique value for r, and that is $r = 1$.

Question 4

Your answer is CORRECT.

A mathematician used the division algorithm to divide an integer a by the number 13. Their computation resulted in the facts that the quotient $q = 3$ and the remainder $r = 0$. Determine the value of a.

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

b) $a = 13$

c) $a = 39$

d) $a = 26$

e) $a = \frac{13}{3}$

Question 5

Your answer is INCORRECT.

The Division Algorithm states

a) If $a, b \in Z$ (with $b \neq 0$), $\exists\, !\, q, r \in Z, b = aq + r$ and $0 \leq r < |a|$

b) If $a, b \in Z$ (with $b \neq 0$), $\exists\ q, r \in Z, a = bq + r$ and $0 \leq r < |b|$

c) If $a, b \in Z$ (with $b \neq 0$), $\exists\, !\, q, r \in Z, a = bq + r$ and $0 \leq r < |b|$

d) If $a, b \in Z$ (with $b \neq 0$), $\exists\, !\, q, r \in Z, q = br + a$ and $0 \leq a < |r|$

e) If $a, b \in Z$ (with $b \neq 0$), $\exists\ q, r \in Z, b = aq + r$ and $0 \leq r < |a|$

Question 6

Your answer is CORRECT.

What is the remainder when the Division Algorithm is used to divide 39 by 18?

a) The remainder is $r = 39$.

b) The remainder is $r = 3$.

c) The remainder is $r = \frac{1}{6}$.

d) The remainder is $r = \frac{13}{6}$.

e) The remainder is $r = 18$.

Question 7

Your answer is INCORRECT.

A mathematician used the division algorithm to divide an integer a by the number 13, and they found that the remainder $r = -1$. Based on this information determine which of the following statements is true.

a) $a \in \{13m + 7 : m \in Z\}$.

b) $a \in \{13m : m \in Z\}$.

c) It is impossible for any integer a to make this true.

d) The only possible value of a is $a = 25$.

Question 8

Your answer is INCORRECT.

The statement $\gcd(25, 84) = 4$ is false. Which of the following best explains *why* ?

a) 4 is not a common divisor. $4|84$, but $4 \not| \ 25$.

b) The statement is false because the $\gcd(25, 84) = 2100$

c) 4 is not a common divisor. $4|25$, but $4 \not| \ 84$.

d) Wait a minute.. 4 *is* the greatest common divisor for 25 and 84. This statement is true!

e) The statement is false because the $\gcd(25, 84) = 84$.

Question 9

Your answer is CORRECT.

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

a) $6, 4$

b) $25, 75$

c) $26, 26$

d) None of these pairs are relatively prime.

e) $26, 25$

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 $a = 16$ and $b = 13$ we produce the statement

$$\exists\, x, y \in Z,\ \ 16x + 13y = \gcd(16, 13).$$

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) $x = 13$ and $y = 0$, and this pair is the only *unique* solution!

b) There are no solutions to this equation. Bezout's Identity does not apply because the only solutions for x and y involve rational numbers!.

c) $x = 9$ and $y = -11$, and *yes* there are other solutions!

d) $x = 9$ and $y = -11$, and this pair is the only *unique* solution!

e) $x = 13$ and $y = 0$, and *yes* there are other solutions!