

NEGATIONS

1. fall0802ge, P.I. G.G.24
What is the negation of the statement "The Sun is shining"?
[A] It is daytime.
[B] The Sun is not shining.
[C] It is cloudy. [D] It is not raining.
2. 080924ge, P.I. G.G.24
What is the negation of the statement "Squares are parallelograms"?
[A] It is not the case that parallelograms are squares.
[B] It is not the case that squares are parallelograms.
[C] Parallelograms are squares.
[D] Parallelograms are not squares.

CONJUNCTIONS

3. 080120a, P.I. G.G.25
What is the smallest integer greater than 1 that is both the square of an integer and the cube of an integer?
[A] 9 [B] 36 [C] 8 [D] 64
4. 010501a, P.I. G.G.25
Stan was trying to guess Melanie's age. She told him her age was an even number and a multiple of three. What could be Melanie's age?
[A] 15 [B] 10 [C] 12 [D] 16

5. 080701a, P.I. G.G.25
Given the true statements: " t is a multiple of 3" and " t is even." What could be a value of t ?
[A] 24 [B] 8 [C] 15 [D] 9
6. 010803a, P.I. G.G.25
The statement " $a > 2$ and $a < 5$ " is true when a is equal to
[A] 2 [B] 10 [C] 5 [D] 3
7. 010706a, P.I. G.G.25
The statement " $x \geq 4$ and $2x - 4 < 6$ " is true when x is equal to
[A] 4 [B] 1 [C] 10 [D] 5
8. 010221a, P.I. G.G.25
Seth is thinking of a number between 20 and 30. The number is prime and not more than 2 away from a perfect square. What is the number?
9. 060416a, P.I. G.G.25
The statement " x is *not* the square of an integer and x is a multiple of 3" is true when x is equal to
[A] 32 [B] 36 [C] 18 [D] 9
10. 089928a
Bob and Ray are describing the same number. Bob says, "The number is a positive even integer less than or equal to 20." Ray says, "The number is divisible by 4." If Bob's statement is true and Ray's statement is false, what are all the possible numbers?

NAME: _____

DISJUNCTIONS

11. 060933ge, P.I. G.G.25
Given: Two is an even integer or three is an even integer.
Determine the truth value of this disjunction.
Justify your answer.

12. 080505a, P.I. G.G.25
The statement " x is divisible by 5 or x is divisible by 4" is *false* when x equals
[A] 27 [B] 16 [C] 10 [D] 20

13. 010003a, P.I. G.G.25
Mary says, "The number I am thinking of is divisible by 2 or it is divisible by 3." Mary's statement is false if the number she is thinking of is
[A] 11 [B] 15 [C] 6 [D] 8

14. 080819a, P.I. G.G.25
The statement "Maya plays on the basketball team or Maya joins the ski club" is *false*.
Which statement is true?
[A] Maya plays on the basketball team and Maya joins the ski club.
[B] Maya does not play on the basketball team and Maya joins the ski club.
[C] Maya plays on the basketball team and Maya does not join the ski club.
[D] Maya does not play on the basketball team and Maya does not join the ski club.

15. 060221a
Given the true statement "John is not handsome" and the false statement "John is handsome or smart." Determine the truth value for the statement "John is smart."

16. 010129a, P.I. G.G.25
Mark says, "The number I see is odd." Jan says, "That same number is prime." The teacher says, "Mark is correct or Jan is correct." Some integers would make the teacher's statement true while other integers would make it false. Give and explain one example of when the teacher's statement is true. Give and explain one example of when the teacher's statement is false.

17. 060622a, P.I. G.G.25
If $x = 3$, which statement is *false*?
[A] x is prime and x is odd.
[B] x is odd and $2x$ is even.
[C] x is odd or x is even.
[D] x is not prime and x is odd.

LAW OF DISJUNCTIVE INFERENCE

18. 010407a
Given the true statements: "Jason goes shopping or he goes to the movies" and "Jason does not go to the movies." Which statement must also be true?
[A] Jason stays home.
[B] Jason does not go shopping.
[C] Jason goes shopping.
[D] Jason does not go shopping and he does not go to the movies.

NAME: _____

19. 010901a

Given the true statements:

"Rob plays basketball or tennis."

"Rob does not play tennis."

Which statement must also be true?

[A] Rob plays basketball.

[B] Rob does not play basketball.

[C] Rob does not play basketball, and he does not play tennis.

[D] Rob plays football.

CONDITIONALS

20. 069902a, P.I. G.G.25

The statement "If x is divisible by 8, then it is divisible by 6" is false if x equals

[A] 48 [B] 14 [C] 6 [D] 32

21. 060517a, P.I. G.G.25

The statement "If x is prime, then it is odd" is false when x equals

[A] 3 [B] 1 [C] 2 [D] 4

22. 060614a, P.I. G.G.25

Given the statement: "If x is a rational number, then \sqrt{x} is irrational." Which value of x makes the statement *false*?

[A] 4 [B] 3 [C] $\frac{3}{2}$ [D] 2

TABLE SOLUTIONS

23. 060110a

At a school costume party, seven girls wore masks and nine boys did not. If there were 15 boys at the party and 20 students did not wear masks, what was the total number of students at the party?

[A] 30 [B] 33 [C] 35 [D] 42

24. 010214a

Frank, George, and Hernando are a plumber, a cabinet maker, and an electrician, though not necessarily in that order. Each can do all work appropriate to his own field, but no work in other fields. Frank was not able to install a new electric line in his home. Hernando was not able to make cabinets. George is also a building contractor who hired one of the other people to do his electrical work. Which statement must be true?

[A] Frank is a plumber.

[B] Frank is an electrician.

[C] Hernando is an electrician.

[D] George is a cabinet maker.

25. 080026a

John, Dan, Karen, and Beth went to a costume ball. They chose to go as Anthony and Cleopatra, and Romeo and Juliet. John got the costumes for Romeo and Cleopatra, but not his own costume. Dan saw the costumes for Juliet and himself. Karen went as Anthony. Beth drove two of her friends, who were dressed as Anthony and Cleopatra, to the ball. What costume did John wear?

[1] B _____

[2] B _____

[3] D _____

[4] C _____

[5] A _____

[6] D _____

[7] A _____

[2] 23, and appropriate work is shown.

[1] Appropriate work is shown, but no answer or an incorrect answer is found.

or [1] 23, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[8] incorrect procedure.

[9] C _____

[3] 2, 6, 10, 14, and 18 and an appropriate method is shown.

[2] One mistake is made with selection, such as including 0.

[1] One of the appropriate sets is found: either 2, 4, 6, 8, 10, 12, 14, 16, 18, 20 or not 4, 8, 12, 16, 20.

or [1] The correct numbers are found, and no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[10] incorrect procedure.

[2] True, and an appropriate justification is written.

[1] True, but the justification is incorrect.

or [1] One conceptual error is made in evaluating the disjunction, but an appropriate justification is written.

[0] True, but no justification is written.

or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an

[11] obviously incorrect procedure.

[12] A _____

[13] A _____

[14] D _____

[2] False, and an appropriate explanation is given.

[1] Appropriate work is shown, but the truth value is missing or is incorrect.

[0] False, but no explanation is given.

or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an

[15] obviously incorrect procedure.

[3] At least one example is shown that makes the statement true, such as 2, 3, 5, 7, 9, or a defined variable; and one example is shown that makes the statement false, such as any even number other than 2, with a correct explanation that shows that the student can recognize odd numbers and prime numbers. The explanation can be in words or as a Venn diagram.

[2] Two correct examples are shown, one that shows the statement is true and one that shows the statement is false, but no explanation or an inappropriate explanation is given.

or [2] Only one correct example is shown, but an appropriate explanation is given.

[1] Only one correct example is shown, and no explanation or an incorrect explanation is given.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[16] incorrect procedure.

[17] D

[18] C

[19] A

[20] D

[21] C

[22] A

[23] B

[24] C

[3] Juliet and an explanation is given of how the identification was reached, such as by a narrative or table.

[2] One error is made in the logic statements or the table, but appropriate results are found.

[1] More than one error is made in the logic statements or the table, but appropriate work is shown.

or [1] Juliet but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[25] incorrect procedure.