Negation and Quantifiers Worksheet 1

Question 1

Consider the statement:

For all integers n, n is even.

Which of the following is the negation of the statement?

A For all integers n, n is odd.

B At least one integer n is not even.

C There exists an integer n that is even.

D None of the integers are even.

Question 2

Consider the statement:

At least one student in Class A submitted the form.

Which of the following is the negation of the statement?

A At least one student in Class A did not submit the form.

B For all students in Class A, the form was submitted.

C None of the students in Class A submitted the form.

D There exists a student in Class A who submitted the form.

Question 3

Consider the statement:

There exists a real number x such that $x^2 < 0$.

Which of the following is the negation of the statement?

A For all real numbers x, $x^2 \geq 0$.

B There exists a real number x such that $x^2 \geq 0$.

C For all real numbers x, $x^2 < 0$.

D None of the real numbers satisfy $x^2 \geq 0$.

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Question 4

Consider the statement:

None of the blue cards have a star.

Which of the following is the negation of the statement?

A For all blue cards, the card has a star.

B At least one blue card has a star.

C None of the blue cards do not have a star.

D There exists a card that is not blue and has a star.

Question 5

Consider the statement:

For all triangles T, T has three sides.

Which of the following is the negation of the statement?

A For all triangles T, T does not have three sides.

B There exists a triangle T that has three sides.

C At least one triangle T does not have three sides.

D None of the triangles have three sides.

Question 6

Consider the statement:

There exists a circle C whose radius is 5*.*

Which of the following is the negation of the statement?

A For all circles C, the radius of C is not 5.

B For all circles C, the radius of C is 5.

C There exists a circle C whose radius is not 5.

D None of the shapes are circles.

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Question 7

Consider the statement:

At least one moon of Planet Zor is green.

Which of the following is the negation of the statement?

A At least one moon of Planet Zor is not green.

B For all moons of Planet Zor, the moon is green.

C None of the moons of Planet Zor are green.

D There exists a green object near Planet Zor.

Question 8

Consider the statement:

None of the password codes end in 7*.*

Which of the following is the negation of the statement?

A At least one password code ends in 7.

B For all password codes, the code ends in 7.

C At least one password code does not end in 7.

D None of the password codes do not end in 7.

Question 9

Consider the statement:

For all points P on line l, P has y-coordinate 2*.*

Which of the following is the negation of the statement?

A For all points P on line l, P does not have y-coordinate 2.

B There exists a point P not on line l with y-coordinate 2.

C At least one point P on line l does not have y-coordinate 2.

D None of the points on line l have x-coordinate 2.

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Question 10

Consider the statement:

There exists a book on the shelf with more than 400 *pages.*

Which of the following is the negation of the statement?

A For all books on the shelf, the book has at most 400 pages.

B For all books on the shelf, the book has more than 400 pages.

C There exists a book on the shelf with at most 400 pages.

D None of the books on the shelf have fewer than 400 pages.

Question 11

Consider the statement:

For all positive integers n, $n+1$ is positive.

Which of the following is the negation of the statement?

A At least one positive integer n has $n+1$ not positive.

B At least one positive integer n has $n+1$ positive.

C For all positive integers n, $n+1$ is not positive.

D There exists an integer n such that n is not positive.

Question 12

Consider the statement:

There exists a rectangle with four equal side lengths.

Which of the following is the negation of the statement?

A For all rectangles, the rectangle has four equal side lengths.

B There exists a rectangle that does not have four equal side lengths.

C For all rectangles, the rectangle does not have four equal side lengths.

D None of the quadrilaterals are rectangles.

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Question 13

Consider the statement:

At least one customer ordered tea or coffee.

Which of the following is the negation of the statement?

A None of the customers ordered tea or coffee.

B At least one customer ordered neither tea nor coffee.

C For all customers, the customer ordered tea and coffee.

D There exists a customer who ordered tea or coffee.

Question 14

Consider the statement:

None of the silver robots blink and whistle.

Which of the following is the negation of the statement?

A At least one silver robot blinks and whistles.

B At least one silver robot does not blink and does not whistle.

C For all silver robots, the robot blinks and whistles.

D None of the silver robots blink or whistle.

Question 15

Consider the statement:

For all chosen integers n, n is odd or n is a multiple of 3.

Which of the following is the negation of the statement?

A At least one chosen integer n is not odd and is not a multiple of 3.

B At least one chosen integer n is odd and is a multiple of 3.

C For all chosen integers n, n is not odd or is not a multiple of 3.

D None of the chosen integers are odd or multiples of 3.

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Question 16

Consider the statement:

There exists a candidate who speaks French and German.

Which of the following is the negation of the statement?

A For all candidates, the candidate does not speak French or does not speak German.

B For all candidates, the candidate does not speak French and does not speak German.

C There exists a candidate who does not speak French or does not speak German.

D None of the candidates speak French or German.

Question 17

Consider the statement:

At least one tile in the mosaic is square and red.

Which of the following is the negation of the statement?

A None of the tiles in the mosaic are both square and red.

B None of the tiles in the mosaic are square or red.

C For all tiles in the mosaic, the tile is square and red.

D At least one tile in the mosaic is not square and not red.

Question 18

Consider the statement:

None of the glimwicks hum at night.

Which of the following is the negation of the statement?

A None of the glimwicks are silent at night.

B For all glimwicks, the glimwick hums at night.

C At least one glimwick hums at night.

D There exists a night with no glimwicks.

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Question 19

Consider the statement:

For all numbers x in list L, $x \leq 10$.

Which of the following is the negation of the statement?

A At least one number x in list L satisfies $x > 10$.

B At least one number x in list L satisfies $x \leq 10$.

C For all numbers x in list L, $x > 10$.

D None of the numbers in list L are greater than or equal to 10.

Question 20

Consider the statement:

There exists a potion bottle that is empty or cracked.

Which of the following is the negation of the statement?

A For all potion bottles, the bottle is not empty and not cracked.

B For all potion bottles, the bottle is not empty or not cracked.

C There exists a potion bottle that is not empty and not cracked.

D None of the potion bottles are empty and cracked.