Negation and Quantifiers Worksheet 2

Question 1

Consider the statement:

For every integer n, there exists an integer m such that $m = n + 1$.

Which of the following is the negation of the statement?

A For every integer n, every integer m is not equal to $n + 1$.

B There exists an integer m such that for every integer n, $m = n + 1$.

C At least one integer n has no integer m equal to $n + 1$.

D At least one integer n has at least one integer m equal to $n + 1$.

Question 2

Consider the statement:

At least one cupboard has every shelf labelled.

Which of the following is the negation of the statement?

A At least one cupboard has every shelf unlabelled.

B Every cupboard has every shelf labelled.

C There exists a shelf that is not in any cupboard and is labelled.

D For every cupboard, at least one shelf in it is not labelled.

Negation and Quantifiers Worksheet 2

Question 3

Consider the statement:

None of the triangles in the diagram has at least one right angle.

Which of the following is the negation of the statement?

A Every triangle in the diagram has every angle right.

B At least one triangle in the diagram has at least one right angle.

C At least one triangle in the diagram has no right angle.

D None of the triangles in the diagram has every angle right.

Question 4

Consider the statement:

For every museum, every painting in it is insured.

Which of the following is the negation of the statement?

A At least one museum has at least one painting in it that is not insured.

B At least one museum has every painting in it uninsured.

C For every museum, at least one painting in it is insured.

D No museum has any insured painting.

Negation and Quantifiers Worksheet 2

Question 5

Consider the statement:

There exists a planet for which none of its moons are icy.

Which of the following is the negation of the statement?

A There exists a planet for which every moon is icy.

B For every planet, none of its moons are icy.

C For every planet, at least one of its moons is icy.

D At least one planet has at least one moon that is not icy.

Question 6

Consider the statement:

For every circle C, there exists a point P on C with x-coordinate 0.

Which of the following is the negation of the statement?

A For every circle C, every point P on C has x-coordinate 0.

B There exists a point P with x-coordinate 0 on every circle C.

C At least one circle C has at least one point P on C with x-coordinate not equal to 0.

D At least one circle C has no point P on C with x-coordinate 0.

Negation and Quantifiers Worksheet 2

Question 7

Consider the statement:

At least one recipe uses every spice in the red box.

Which of the following is the negation of the statement?

A For every recipe, at least one spice in the red box is not used by it.

B Every recipe uses every spice in the red box.

C At least one recipe uses no spice from the red box.

D There exists a spice in the red box used by every recipe.

Question 8

Consider the statement:

None of the glimwicks has every wing glowing.

Which of the following is the negation of the statement?

A Every glimwick has at least one wing not glowing.

B At least one glimwick has at least one wing not glowing.

C At least one glimwick has every wing glowing.

D None of the glimwicks has at least one glowing wing.

Negation and Quantifiers Worksheet 2

Question 9

Consider the statement:

For every positive real number x, there exists a positive real number y such that $xy = 1$.

Which of the following is the negation of the statement?

A For every positive real number x, every positive real number y satisfies $xy \neq 1$.

B At least one positive real number x has no positive real number y such that $xy = 1$.

C At least one positive real number y works for every positive real number x.

D For every positive real number x, at least one positive real number y satisfies $xy \neq 1$.

Question 10

Consider the statement:

There exists a door code in which every digit is odd.

Which of the following is the negation of the statement?

A There exists a door code in which every digit is even.

B Every door code has every digit odd.

C At least one door code has at least one digit not odd.

D For every door code, at least one digit in it is not odd.

Negation and Quantifiers Worksheet 2

Question 11

Consider the statement:

For every student, there exists one of that student's projects such that every page in that project has a title.

Which of the following is the negation of the statement?

A For every student, every project has at least one page with no title.

B At least one student has at least one project in which every page has no title.

C At least one student has the property that each project by that student has at least one page with no title.

D Every student has at least one project in which at least one page has a title.

Question 12

Consider the statement:

There exists a city such that every park in that city has at least one working fountain.

Which of the following is the negation of the statement?

A There exists a city such that every park in it has no working fountain.

B For every city, at least one park in that city has no working fountain.

C For every city, every park in that city has at least one working fountain.

D At least one city has at least one park with at least one working fountain.

Negation and Quantifiers Worksheet 2

Question 13

Consider the statement:

None of the archivists has a shelf on which every scroll is red.

Which of the following is the negation of the statement?

A Every archivist has a shelf on which at least one scroll is not red.

B At least one archivist has a shelf on which at least one scroll is not red.

C None of the archivists has any shelf with a red scroll.

D At least one archivist has at least one shelf on which every scroll is red.

Question 14

Consider the statement:

For every real number x, there exists a real number y such that every positive real number z satisfies $x + y < z$.

Which of the following is the negation of the statement?

A At least one real x is such that every real y has at least one positive real z with $x + y \geq z$.

B For every real x, every real y has at least one positive real z with $x + y \geq z$.

C At least one real x has at least one real y such that every positive real z satisfies $x + y \geq z$.

D For every real x, there exists a real y such that every positive real z satisfies $x + y \geq z$.

Negation and Quantifiers Worksheet 2

Question 15

Consider the statement:

At least one robot scans at least one panel in every room.

Which of the following is the negation of the statement?

A Every robot scans every panel in every room.

B At least one robot scans no panel in any room.

C For every robot, at least one room has no panel scanned by that robot.

D For every robot, every room has at least one panel scanned by that robot.

Question 16

Consider the statement:

For every triangle, there exists a vertex such that every side touching that vertex is shorter than 10 *cm.*

Which of the following is the negation of the statement?

A For every triangle, every vertex touches at least one side shorter than 10 cm.

B At least one triangle has at least one vertex touching every side shorter than 10 cm.

C For every triangle, there exists a vertex such that at least one side touching it is not shorter than 10 cm.

D At least one triangle has the property that every vertex touches at least one side that is not shorter than 10 cm.

Negation and Quantifiers Worksheet 2

Question 17

Consider the statement:

There exists a spellbook in which none of the chapters contains at least one forbidden rune.

Which of the following is the negation of the statement?

A There exists a spellbook in which every chapter contains at least one forbidden rune.

B For every spellbook, at least one chapter contains at least one forbidden rune.

C For every spellbook, every chapter contains every forbidden rune.

D At least one spellbook has at least one chapter with no forbidden rune.

Question 18

Consider the statement:

For every island, at least one bridge reaches every village on that island.

Which of the following is the negation of the statement?

A At least one island has the property that every bridge fails to reach at least one village on that island.

B Every island has every bridge reaching every village on that island.

C At least one island has at least one bridge that reaches no village on that island.

D For every island, at least one bridge fails to reach at least one village on that island.

Negation and Quantifiers Worksheet 2

Question 19

Consider the statement:

There exists a polynomial such that for every integer n, at least one coefficient is greater than n.

Which of the following is the negation of the statement?

A There exists a polynomial such that every coefficient is less than or equal to every integer n.

B For every polynomial, every integer n is smaller than at least one coefficient.

C At least one polynomial has at least one coefficient greater than every integer n.

D For every polynomial, there exists an integer n such that every coefficient is less than or equal to n.

Question 20

Consider the statement:

None of the starwhales carries a map for every moon that has at least one crater.

Which of the following is the negation of the statement?

A Every starwhale fails to carry a map for at least one moon that has at least one crater.

B At least one starwhale carries a map for at least one moon that has no crater.

C At least one starwhale carries a map for every moon that has at least one crater.

D None of the starwhales carries a map for at least one moon that has at least one crater.