

Geometry

Unit 3 Review - Intro to Proofs

Key

On problems 1-5 circle the letter next to the best answer. Take your time and check your work.

1. Which statement is the converse of the given statement?

If points P, Q, and R are collinear, then Q is between P and R.

- (a) If Q is not between P and R, then points P, Q, and R are not collinear. (b) If points P, Q, and R are not collinear, then Q is not between P and R.
- (c) If Q is between P and R, then points P, Q, and R are collinear. (d) If points P, Q, and R are collinear, then Q is between P and R.

2. Which statement is a good definition of a square?

- (a) A square is a shape with four sides. (b) A square is a shape with four congruent sides.
- (c) A square is a quadrilateral with four congruent sides and four congruent angles. (d) A square is a parallelogram with four congruent angles.

3. Which property justifies this statement: If $4x = 16$, then $x = 4$

- (a) Multiplication Property of Equality (b) Reflexive Property
- (c) Division Property of Equality (d) Symmetric Property

4. The Symmetric Property justifies which statement below?

- (a) If $y - 17 = g$, then $y = g + 17$ (b) If $\angle J \cong \angle R$ and $\angle R \cong \angle H$, then $\angle J \cong \angle H$
- (c) If $AM = RS$, then $RS = AM$ (d) If $5(3a - 4) = 120$, then $15a - 20 = 120$

Name the property that justifies each statement.

5. $m\angle ABC = m\angle DEF$ and $m\angle DEF = m\angle ABC$

5. Symmetric

6. $AB = CD$, $CD = EF$. Therefore, $AB = EF$.

6. Transitive

7. $x + 7 = 5$; $x + 7 - 7 = 5 - 7$

7. Subtraction Prop

8. $x = y$; If $x = 18$, then $y = 18$.

8. Substitution

9. $\angle A \cong \angle A$

9. Reflexive

10. If $x + y = 7$, then $4(x + y) = 28$

10. Multiplication Prop

11. Fill in the blanks below to complete the proof.

Given: $m\angle ABC = 80$

Prove: $x = 8$

a. $m\angle ABC = 80$

a. Given

b. $m\angle ABD + m\angle DBC = m\angle ABC$

a. Angle Addition

c. $(3x + 3) + (6x + 5) = 80$

b. Substitution

d. $9x + 8 = 80$

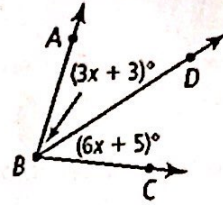
c. CLT

e. $9x = 72$

d. Subtraction Prop

f. $x = 8$

e. Division Prop



12. Name the property of equality that justifies each statement.

Given: $3(x - 3) = x + 7$

Prove: $x = 8$

Proof:

Statements

Reasons

a. $3(x - 3) = x + 7$

a. Given

b. $3x - 9 = x + 7$

b. Distributive Prop

c. $3x = x + 16$

c. Addition Prop

d. $2x = 16$

d. Subtraction Prop

e. $x = 8$

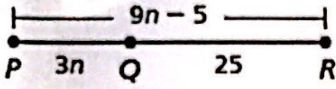
e. Division Prop

13.

$$m\overline{PR} = 9n - 5$$

Given: $m\overline{PQ} = 3n$

$$m\overline{QR} = 25$$



Prove: $n = 5$

| | Statement | | Reason |
|---|---------------------------|---|------------------|
| 1 | $m\overline{PR} = 9n - 5$ | 1 | Given |
| 2 | $m\overline{PQ} = 3n$ | 2 | Given |
| 3 | $m\overline{QR} = 25$ | 3 | Given |
| 4 | $PQ + QR = PR$ | 4 | Segment Addition |
| 5 | $3n + 25 = 9n - 5$ | 5 | Substitution |
| 6 | $-6n + 25 = -5$ | 6 | Subtraction Prop |
| 7 | $-6n = -30$ | 7 | Subtraction Prop |

$$n = 5$$

Division Prop

14. Given:

$$5j + k = m$$

$$k = 3j$$

$$m = p$$

Prove:

$$p = 8j$$

| | Statement | | Reason |
|---|---------------|---|---------------------------|
| 1 | $5j + k = m$ | 1 | Given |
| 2 | $k = 3j$ | 2 | Given |
| 3 | $m = p$ | 3 | Given |
| 4 | $5j + 3j = m$ | 4 | Substitution |
| 5 | $8j = m$ | 5 | CLT |
| 6 | $8j = p$ | 6 | Transitive / Substitution |
| 7 | $p = 8j$ | 7 | Symmetric |

Short Response

SR #1: Determine if the following statements are true or false. If false, provide a counterexample.

a. If a whole number is a multiple of 2, then the whole number is even.

True

b. Animals that eat carrots are rabbits.

False → horses

c. Two lines that intersect to form four 90° angles are perpendicular.

True

d. All plurals end with the letter s.

False → geese

e. If a quadrilateral has four congruent angles, then the quadrilateral is a square.

False → rectangle

f. An isosceles triangle is a triangle with at least two congruent angles.

True

SR #2: Use the following statement to answer the following questions: **Cats are mammals.**

a. Write a conditional statement.

If an animal is a cat, then it is a mammal.

b. Is your conditional true or false? If false, give a counter example.

True

c. Write a converse statement.

If an animal is a mammal, then it is a cat

d. Is your converse true or false? If false, give a counterexample.

False → dogs are mammals