Inductive Reasoning

Conjecture: an educated guess

Inductive Reasoning: the considerations and analyses made after several specific situations and patterns are arrived at a conjecture; it uses specific examples to arrive at a general rule, generalization, or conclusion

Counterexample: a false example that shows a conjecture is not true

Practice Exercises

A. Determine if the conjecture is *True* or *False* based on the given information.

1. *Given* The ages of the students in a Grade 8 class are 12, 13, 12, 12, 14, 13, 13, 13, 12, and 13.
   Conjecture All the students in the class are at least 12 years old.
2. *Given* D, E, and F are distinct points.
   Conjecture D, E, and F are collinear.
3. *Given* $\angle 1$ and $\angle 2$ are complementary angles. $\angle 2$ and $\angle 3$ are complementary angles.
   Conjecture $\angle 1 \cong \angle 3$
4. *Given* $\angle P$ and $\angle R$ are right angles.
   Conjecture $\angle P \cong \angle R$
5. *Given* $\overline{AB}$, $\overline{BC}$, $\overline{CD}$, and $\overline{DA}$.
   Conjecture A, B, C, and D are collinear points.

B. Write a conjecture based on the given information.

1. Point S is the midpoint of $\overline{PT}$.
2. $\overline{MN}$ intersects $\overline{PS}$ at O.
3. $ABCD$ is a square.
4. Points A, B, C, D, E, and F with no three collinear.
5. N and D are midpoints of sides $\overline{AR}$ and $\overline{AE}$ in $\triangle ARE$.

Problem Set

A. Determine if the conjecture is *True* or *False* based on the given information.

1. *Given* $B(-5,0)$, $O(5,0)$, and $Y(0,0)$
   Conjecture $BY = YO$
2. *Given* $P(-3,0)$, $Q(1,3)$, and $B(-3,3)$
   Conjecture P, Q, and B are collinear points.
3. *Given* $\overline{AB}$, $\overline{BC}$, and $\overline{CD}$.
   Conjecture A, B, C, and D are collinear points.
4. *Given* $\overline{AC} \cong \overline{CD}$
   Conjecture C is the midpoint of $\overline{AD}$.
5. *Given* Point O is between M and N.
   Conjecture $\overline{MO} \cong \overline{ON}$

B. Write a conjecture based on the given information.

1. $\overline{JU}$, $\overline{UD}$, $\overline{DY}$, $\overline{JY}$ with only U, D, and Y collinear.
2. $ABCD$ is a quadrilateral with $\overline{AB} \| \overline{DC}$ and $\overline{AD} \| \overline{BC}$.
3. $PQRS$ is a rectangle and A, B, C, and D are midpoints of its sides.
4. $\overline{TS}$ intersects $\overline{QR}$ at O.
5. $\overline{MA}$, $\overline{AR}$, and $\overline{RE}$ lie on the same plane with R between M and E.

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