Build independence

LESSON 1.1 / Geometry language and logical foundations

Name: _____ Date: _____

Attempt first. Label every sketch. Use a notebook for extended explanations.

01 / Objects and notation

State how many endpoints a line, a ray and a segment have.

02 / Objects and notation

Name the ray with endpoint P that passes through Q, using standard geometric notation.

03 / Objects and notation

Explain the difference between $\overline{AB}$ and $AB = 9\ \text{cm}$.

04 / Objects and notation

Does reversing the letters change $\overline{AB}$ or $\overleftrightarrow{AB}$? Explain.

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05 / Objects and notation

Does $\overrightarrow{AB}$ equal $\overrightarrow{BA}$ for distinct A and B?

06 / Objects and notation

A, B, C and D lie on a line in that order. Name the same ray as $\overrightarrow{AB}$ using D.

07 / Position

For the order A-B-C-D, name a ray opposite to $\overrightarrow{BC}$.

08 / Position

A, B and C are collinear. Can they also be coplanar? Explain.

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09 / Position

Three points are said to determine a unique plane. State the missing condition.

10 / Position

How many distinct lines pass through two distinct points P and Q? Name the accepted fact.

11 / Position

Can two distinct lines have two distinct common points? Justify.

12 / Position

Why is the finite shaded parallelogram used for a plane not a boundary of the mathematical plane?

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13 / Definitions and evidence

Classify: “A midpoint is a point on a segment dividing it into two congruent parts.”

14 / Definitions and evidence

Classify: “Exactly one line passes through two distinct points”, taken as an accepted starting fact.

15 / Definitions and evidence

A statement has been established from definitions, accepted starting facts and earlier results. What is its role?

16 / Definitions and evidence

A point X satisfies XA=XB but lies off segment AB. Is X its midpoint? Explain.

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17 / Definitions and evidence

Two segments have matching single tick marks. What length equality is justified?

18 / Definitions and evidence

Two unmarked segments look equal. Is their equality false, proved, or not established by the sketch?

19 / Reasoning

A learner measures five isosceles triangles and conjectures that every triangle is isosceles. Name the reasoning used to form the conjecture.

20 / Reasoning

Give a counterexample to “every triangle is isosceles”, explaining both conditions.

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21 / Reasoning

Give a counterexample to “every quadrilateral with four equal sides is a square”.

22 / Reasoning

Write the converse of “if a quadrilateral is a square, then it is a rectangle”. Is the converse true?

23 / Deduction

Given $AB = CD$, $CD = EF$ and $EF = 12\ \text{cm}$, determine AB. Name a reason.

24 / Challenge

M is stated to be the midpoint of segment AB. Given $AM = 3x + 1$ and $MB = 5x - 7$, find x and AB. State the reasons.

Sketch, label & justify

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Use these spaces for your notation, plane and counterexample diagrams.

Diagram / givens / conclusion / reason

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