Lesson 11: Conditions on Measurements That Determine a Triangle

Problem Set

1. Decide whether each set of three given lengths determines a triangle. For any set of lengths that does determine a triangle, use a ruler and compass to draw the triangle. Label all side lengths. For sets of lengths that do not determine a triangle, write “Does not determine a triangle,” and justify your response.
2. $3 cm$, $4 cm$, $5 cm$
3. $1 cm$, $4 cm$, $5 cm$
4. $1 cm$, $5 cm$, $5 cm$
5. $8 cm$, $3 cm$, $4 cm$
6. $8 cm$, $8 cm$, $4 cm$
7. $4 cm$, $4 cm$, $4 cm$
8. For each angle measurement below, provide one angle measurement that will determine a triangle and one that will not determine a triangle. Provide a brief justification for the angle measurements that will not form a triangle. Assume that the angles are being drawn to a horizontal segment $AB$; describe the position of the non-horizontal rays of angles $∠A$ and $∠B$.

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| $$∠A$$ | $∠B$**: A Measurement That Determines a Triangle** | $∠B$**: A Measurement That *Does Not* Determine a Triangle** | **Justification for No Triangle** |
| $$40°$$ |  |  |  |
| $$100°$$ |  |  |  |
| $$90°$$ |  |  |  |
| $$135°$$ |  |  |  |

1. For the given side lengths, provide the minimum and maximum whole number side lengths that determine a triangle.

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| **Given Side Lengths** | **Minimum Whole Number Third Side Length** | **Maximum Whole Number Third Side Length** |
| $5 cm$, $6 cm$ |  |  |
| $3 cm$, $7 cm$ |  |  |
| $4 cm$, $10 cm$ |  |  |
| $1 cm$, $12 cm$ |  |  |