Lesson 4.3.1: Applying Theorems on Triangle Inequality

Practice Exercises 4.3.1

A. Tell whether a triangle can be constructed with segments having these lengths. Write *Yes* or *No*.

1. 6, 8, 10
2. 4, 4, 7
3. 4, 5, 10
4. 4, 11, 12
5. 6, 8, 17

B. The measures of two sides of a triangle are given. Between what two numbers must the length of the third side fall?

1. 8 and 11
2. 20 and 30
3. 4 and 70
4. 7.5 and 2.5
5. 5 and 9

C. Given the lengths of the sides, identify the largest and smallest angle in each triangle.

1. $\triangle ABC : AB = 15, BC = 8$, and $AC = 12$
2. $\triangle DEF : DE = 5, EF = 8$, and $DF = 12$
3. $\triangle GHI : GH = 4, HI = 6$, and $GI = 3$
4. $\triangle JKL : JK = 4.9, KL = 4.5$, and $JL = 5.2$
5. $\triangle MNP : MN = 3\frac{2}{3}, NP = 6\frac{1}{2}$ and $MP = 5\frac{1}{4}$

D. Given the measures of two angles, identify the longest and shortest side in each triangle.

1. $\triangle ABC : m\angle A = 20°$ and $m\angle B = 103°$
2. $\triangle DEF : m\angle D = 17°$ and $m\angle F = 53°$
3. $\triangle GHI : m\angle H = 30°$ and $m\angle I = 100°$
4. $\triangle JKL : m\angle J = 26°$ and $m\angle K = 95°$
5. $\triangle MNP : m\angle N = 112°$ and $m\angle P = 30°$

E. List the sides of each triangle in order from shortest to longest if the angles have the indicated measures.

1. $\triangle ABC : m\angle A = 7x + 25, m\angle B = 96 - 5x$ and $m\angle C = 12x + 3$
2. $\triangle DEF : m\angle D = 5x + 20, m\angle E = 4x + 18$ and $m\angle F = 7x + 12$
3. $\triangle GHI : m\angle G = 8x + 6, m\angle H = 4x - 2$ and $m\angle I = 9x + 8$
4. $\triangle JKL : m\angle J = 16x + 3, m\angle K = 4x - 3$ and $m\angle L = 7x - 9$
5. $\triangle MNP : m\angle M = 16x - 1, m\angle N = 7x + 3$ and $m\angle P = 8x - 8$

Activity 4.3.1

A. Tell whether a triangle can be constructed with segments having these lengths. Write *Yes* or *No*.

1. 5, 7, 13
2. 5, 5, 8
3. 5, 6, 11
4. 5, 10, 11
5. 7, 9, 16

B. The measures of two sides of a triangle are given. Between what two numbers must the length of the third side fall?

1. 9 and 10
2. 10 and 20
3. 5 and 60
4. 6.5 and 3.5
5. 6 and 10

C. Given the lengths of the sides, identify the largest and smallest angle in each triangle.

1. $\triangle ABC : AB = 16, BC = 9$, and $AC = 11$
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D. Given the measures of two angles, identify the longest and shortest side in each triangle.

1. $\triangle ABC : m\angle A = 25°$ and $m\angle B = 113°$
2. $\triangle DEF : m\angle D = 18°$ and $m\angle F = 57°$
3. $\triangle GHI : m\angle H = 35°$ and $m\angle I = 110°$
4. $\triangle JKL : m\angle J = 23°$ and $m\angle K = 94°$
5. $\triangle MNP : m\angle N = 117°$ and $m\angle P = 20°$

E. List the sides of each triangle in order from shortest to longest if the angles have the indicated measures.

1. $\triangle ABC : m\angle A = 7x - 2, m\angle B = 20x - 10$ and $m\angle C = 6x - 6$
2. $\triangle DEF : m\angle D = 7x - 4, m\angle E = 17x - 4$ and $m\angle F = 2x + 6$
3. $\triangle GHI : m\angle G = 10x + 5, m\angle H = 9x - 7$ and $m\angle I = 4x - 2$
4. $\triangle JKL : m\angle J = 8x + 3, m\angle K = 6x + 1$ and $m\angle L = 5x + 5$
5. $\triangle MNP : m\angle M = 10x + 3, m\angle N = 13x - 3$ and $m\angle P = 8x - 6$

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