

NAME: _____

G.G.33: Investigate, justify and apply the triangle inequality theorem

1. 080214a, P.I. G.G.33

If the lengths of two sides of a triangle are 4 and 10, what could be the length of the third side?

[A] 6 [B] 8 [C] 16 [D] 14

2. 080018a, P.I. G.G.33

If two sides of a triangle are 1 and 3, the third side may be

[A] 2 [B] 5 [C] 3 [D] 4

3. 080520a, P.I. G.G.33

Sara is building a triangular pen for her pet rabbit. If two of the sides measure 8 feet and 15 feet, the length of the third side could be

[A] 13 ft [B] 23 ft [C] 7 ft [D] 3 ft

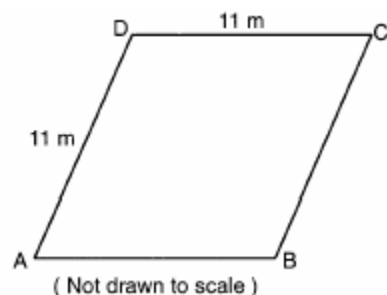
4. 069905a, P.I. G.G.33

The direct distance between city *A* and city *B* is 200 miles. The direct distance between city *B* and city *C* is 300 miles. Which could be the direct distance between city *C* and city *A*?

[A] 50 miles [B] 350 miles
[C] 650 miles [D] 550 miles

5. 010010a, P.I. G.G.33

A plot of land is in the shape of rhombus *ABCD* as shown below.



Which can *not* be the length of diagonal *AC*?

[A] 11 m [B] 18 m [C] 4 m [D] 24 m

6. 080425a, P.I. G.G.33

Which set can *not* represent the lengths of the sides of a triangle?

[A] {5,5,11} [B] {7,7,12}
[C] {4,5,6} [D] {8,8,8}

7. 060515a, P.I. G.G.33

Which set could *not* represent the lengths of the sides of a triangle?

[A] {2,5,9} [B] {7,9,11}
[C] {5,10,12} [D] {3,4,5}

8. 080916ge, P.I. G.G.33

Which set of numbers represents the lengths of the sides of a triangle?

[A] {5, 18, 13} [B] {16, 24, 7}
[C] {6, 17, 22} [D] {26, 8, 15}

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9. 080830a, P.I. G.G.33

Phil is cutting a triangular piece of tile. If the triangle is scalene, which set of numbers could represent the lengths of the sides?

- [A] $\{4,5,6\}$ [B] $\{5,5,8\}$
[C] $\{2,4,7\}$ [D] $\{3,5,8\}$

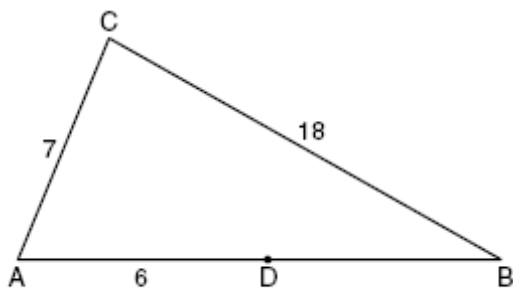
10. 080120b, P.I. G.G.33

A box contains one 2-inch rod, one 3-inch rod, one 4-inch rod, and one 5-inch rod. What is the maximum number of different triangles that can be made using these rods as sides?

- [A] 1 [B] 4 [C] 2 [D] 3

11. fall0819ge, P.I. G.G.33

In the diagram below of $\triangle ABC$, D is a point on \overline{AB} , $AC = 7$, $AD = 6$, and $BC = 18$.



(Not drawn to scale)

The length of \overline{DB} could be

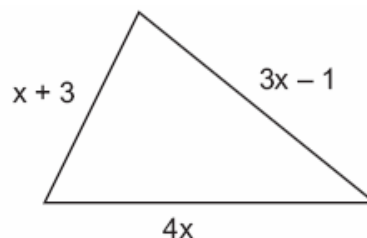
- [A] 5 [B] 19 [C] 12 [D] 25

12. 010534a, P.I. G.G.33

José wants to build a triangular pen for his pet rabbit. He has three lengths of boards already cut that measure 7 feet, 8 feet, and 16 feet. Explain why José cannot construct a pen in the shape of a triangle with sides of 7 feet, 8 feet, and 16 feet.

13. 060227a, P.I. G.G.33

The plot of land illustrated in the accompanying diagram has a perimeter of 34 yards. Find the length, in yards, of *each* side of the figure. Could these measures actually represent the measures of the sides of a triangle? Explain your answer.



14. 060924ge, P.I. G.G.33

Side \overline{PQ} of $\triangle PQR$ is extended through Q to point T . Which statement is *not* always true?

- [A] $m\angle RQT > m\angle P$
[B] $m\angle RQT > m\angle PQR$
[C] $m\angle RQT > m\angle R$
[D] $m\angle RQT = m\angle P + m\angle R$

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[1] B

[2] C

[3] A

[4] B

[5] D

[6] A

[7] A

[8] C

[9] A

[10] D

[11] C

[2] The statements $7 + 8 = 15$ and “15 is not greater than 16” are written or the explanation is given that the sum of any two sides of a triangle must be greater than the third side.

[1] An explanation is written that includes a reference to the triangle inequality, but the explanation is not complete or an incorrect conclusion is stated.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[12] incorrect procedure.

[3] 7, 11, 16, and yes, and appropriate work is shown, and an appropriate explanation of the Triangle Inequality theorem is given.

[2] 7, 11, 16, and yes, and appropriate work is shown, but no explanation or an incorrect explanation of the Triangle Inequality theorem is given.

or [2] One computational error is made, but appropriate substitution is shown, and an appropriate explanation is given.

or [2] The correct equation is written but not solved, but the Triangle Inequality theorem is stated correctly.

[1] Appropriate work is shown, and $x = 4$ is determined, but no further work is shown.

or [1] The Triangle Inequality theorem is stated correctly but not evaluated for the sides, or the correct equation is written, but no further work is shown.

or [1] 7, 11, 16, and yes, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[13] incorrect procedure.

[14] B