

Geometry "yes," if the sums of any 2 #s is > the 3rd #.

Name Solutions

Triangle Inequality Theorem test all combinations. Date _____ Period _____

State if the three numbers can be the measures of the sides of a triangle.

1) 12, 26, 11

$$\begin{aligned}12 + 26 &> 11 \\38 &> 11 \checkmark \\26 + 11 &> 12 \\37 &> 12 \checkmark\end{aligned}$$

$$\begin{aligned}12 + 11 &> 26 \\23 &> 26 \times \\ \boxed{\text{NO}}\end{aligned}$$

2) 6, 9, 8

$$\begin{aligned}6 + 8 &> 9 \\14 &> 9 \checkmark \\6 + 9 &> 8 \\15 &> 8 \checkmark\end{aligned}$$

$$\begin{aligned}9 + 8 &> 6 \\17 &> 6 \checkmark \\ \boxed{\text{YES}}\end{aligned}$$

3) 7, 3, 7

$$\begin{aligned}7 + 3 &> 7 \\10 &> 7 \checkmark \\3 + 7 &> 7 \\10 &> 7 \checkmark\end{aligned}$$

$$\begin{aligned}7 + 7 &> 3 \\14 &> 3 \checkmark \\ \boxed{\text{YES}}\end{aligned}$$

4) 12, 6, 6

$$\begin{aligned}6 + 6 &> 12 \\12 &> 12 \times \\ = \text{is not } &> \blacktriangledown\end{aligned}$$

$\boxed{\text{NO}}$

5) 9, 17, 8

$$\begin{aligned}9 + 17 &> 8 \\26 &> 8 \checkmark \\9 + 8 &> 17 \\17 &> 17 \times\end{aligned}$$

(I can stop as soon as I find an "X")

$\boxed{\text{NO}}$

6) 4, 9, 8

$$\begin{aligned}4 + 8 &> 9 \\12 &> 9 \checkmark \\4 + 9 &> 8 \\13 &> 8 \checkmark\end{aligned}$$

$$\begin{aligned}9 + 8 &> 4 \\17 &> 4 \checkmark\end{aligned}$$

$\boxed{\text{YES}}$

7) 11, 10, 17

$$\begin{aligned}11 + 10 &> 17 \\21 &> 17 \checkmark \\11 + 17 &> 10 \\28 &> 10 \checkmark\end{aligned}$$

$$\begin{aligned}10 + 17 &> 11 \\27 &> 11 \checkmark\end{aligned}$$

$\boxed{\text{YES}}$

8) 6, 7, 4

$$\begin{aligned}\cancel{6 + 4} &> \cancel{10} \\6 + 4 &> 7 \\10 &> 7 \checkmark \\6 + 7 &> 4 \\13 &> 4 \checkmark\end{aligned}$$

$$\begin{aligned}7 + 4 &> 6 \\11 &> 6 \checkmark\end{aligned}$$

$\boxed{\text{yes}}$

9) 8, 19, 9

$$\begin{aligned}8 + 9 &> 19 \\17 &> 19 \times\end{aligned}$$

$\boxed{\text{NO}}$

10) 12, 6, 14

$$\begin{aligned}12 + 6 &> 14 \\18 &> 14 \checkmark \\12 + 14 &> 6 \\26 &> 6 \checkmark\end{aligned}$$

$$\begin{aligned}6 + 14 &> 12 \\20 &> 12 \checkmark\end{aligned}$$

$\boxed{\text{yes}}$

11) 22, 11, 9

$$\begin{aligned}11 + 9 &> 22 \\20 &> 22 \times\end{aligned}$$

$\boxed{\text{NO}}$

12) 11, 11, 3

$$\begin{aligned}11 + 3 &> 11 \\14 &> 11 \checkmark \\11 + 11 &> 3 \\22 &> 3 \checkmark\end{aligned}$$

$$\begin{aligned}3 + 11 &> 11 \\14 &> 11 \checkmark\end{aligned}$$

$\boxed{\text{yes}}$

Two sides of a triangle have the following measures. Find the range of possible measures for the third side.

3rd side is between the difference & the sum of the other 2 sides

13) 9, 11

$$11 - 9 < x < 11 + 9$$

$$\boxed{2 < x < 20}$$

(not = 2, not = 20)

14) 6, 8

$$8 - 6 < x < 8 + 6$$

$$\boxed{2 < x < 14}$$

15) 12, 7

$$12 - 7 < x < 12 + 7$$

$$\boxed{5 < x < 19}$$

16) 10, 12

$$12 - 10 < x < 12 + 10$$

$$\boxed{2 < x < 22}$$

17) 7, 10

$$10 - 7 < x < 10 + 7$$

$$\boxed{3 < x < 17}$$

18) 7, 8

$$8 - 7 < x < 8 + 7$$

$$\boxed{1 < x < 15}$$

19) 8, 10

$$10 - 8 < x < 10 + 8$$

$$\boxed{2 < x < 18}$$

20) 12, 6

$$12 - 6 < x < 12 + 6$$

$$\boxed{6 < x < 18}$$

21) 6, 9

$$9 - 6 < x < 9 + 6$$

$$\boxed{3 < x < 15}$$

22) 11, 7

$$11 - 7 < x < 11 + 7$$

$$\boxed{4 < x < 18}$$