

Triangle Inequality, Isosceles and Equilateral Triangle

Find the measure of each angle indicated. Check Your Answers!

1)  $50^\circ$

$70 + 60 + ? = 180$   
 $130 + ? = 180$   
 $-130$   
 $-130$   
 $? = 50^\circ$

2)  $31^\circ$

$? + 128 + 21 = 180$   
 $? + 149 = 180$   
 $? = 31^\circ$

Solve for x.

3)  $2$

$73 + 60 + 23x + 1 = 180$   
 $23x + 134 = 180$   
 $23x = 46$   
 $x = 2$

4)  $-6$

$90 + 60 + x + 36 = 180$   
 $x + 186 = 180$   
 $-186$   
 $-186$   
 $x = -6$

Find the measure of each angle indicated.

5)  $50^\circ$

$180 - 50 - 90 = 40$   
 $180 - 90 - 40 = 50$   
 $? = 50^\circ$

6)  $98^\circ$

$180 - 20 - 120 = 40$   
 $180 - 42 - 40 = 98$   
 $? = 98^\circ$

Find the value of x.

7)

def of ISO  $\Delta$   
 $2x - 10 = 10$   
 $+10$   
 $2x = 20$   
 $\frac{2x}{2} = \frac{20}{2}$   
 $x = 10$

A) -8    \*B) 10  
C) 9    D) 6

8)

def of ISO  $\Delta$   
 $9 = 2x - 3$   
 $+3$   
 $12 = 2x$   
 $\frac{12}{2} = \frac{2x}{2}$   
 $6 = x$

A) 11    \*B) 6  
C) -10    D) -7

9)

def of Equilateral  $\Delta$   
 $6 = 2x - 8$   
 $+8$   
 $14 = 2x$   
 $\frac{14}{2} = \frac{2x}{2}$   
 $7 = x$

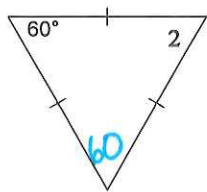
A) 8    B) -9  
C) -8    \*D) 7

10)

def of ISO  $\Delta$   
 $7 = 2x - 11$   
 $+11$   
 $18 = 2x$   
 $\frac{18}{2} = \frac{2x}{2}$   
 $9 = x$

A) -10    B) 11  
\*C) 9    D) -7

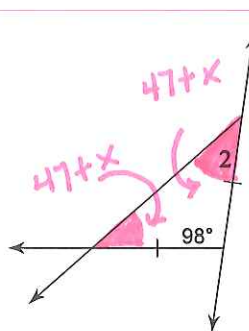
11)  $m\angle 2 = 7x - 3$



$60 = 7x - 3$   
 $+3 \quad +3$   
 $\frac{63}{7} = \frac{7x}{7}$

- A) 6  
 \*C) 9  
 B) -11  
 D) -8

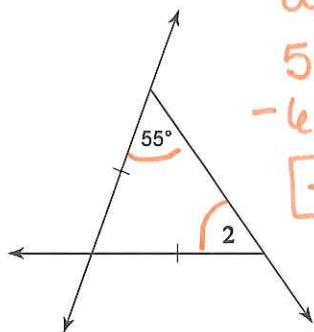
12)  $m\angle 2 = 47 + x$



$47+x + 47+x + 98 = 180$   
 $2x + 192 = 180$   
 $\frac{2x}{2} = \frac{-12}{2}$   
 $x = -6$

- A) 9  
 \*C) -6  
 B) 12  
 D) -8

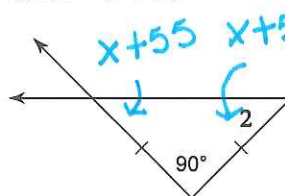
13)  $m\angle 2 = x + 66$  base  $\angle$ s of isos  $\Delta$  are  $\cong$



$55 = x + 66$   
 $-66 \quad -66$   
 $-11 = x$

- A) 9  
 \*C) -11  
 B) -10  
 D) 11

14)  $m\angle 2 = x + 55$

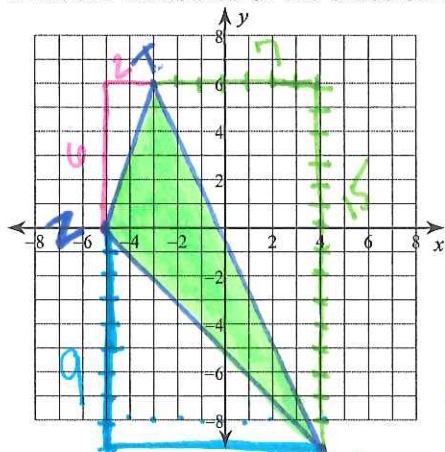


base  $\angle$ s of isos  $\Delta$   
 $x+55 + x+55 + 90 = 180$   
 $2x + 200 = 180$   
 $-200 \quad -200$   
 $\frac{2x}{2} = \frac{-20}{2}$   
 $x = -10$

- A) -8  
 \*B) -10  
 C) 9  
 D) 6

Classify the triangle by its sides. Show ALL work.

15) Find the measures of the sides of  $\Delta TWZ$  with vertices at  $T(-3,6)$ ,  $W(4,-9)$  and  $Z(-5,0)$



$6^2 + 2^2 = TZ^2$   
 $36 + 4 = TZ^2$   
 $\sqrt{40} = \sqrt{TZ^2}$   
 $\sqrt{4} \quad \sqrt{10}$   
 $TZ = 2\sqrt{10}$

$7^2 + 15^2 = TW^2$   
 $49 + 225 = TW^2$   
 $\sqrt{274} = TW$

$9^2 + 9^2 = ZW^2$   
 $81 + 81 = ZW^2$   
 $\sqrt{162} = ZW^2$   
 $\sqrt{81} \quad \sqrt{2}$   
 $ZW = 9\sqrt{2}$

$\Delta TWZ$  is a scalene triangle because it doesn't have any congruent sides