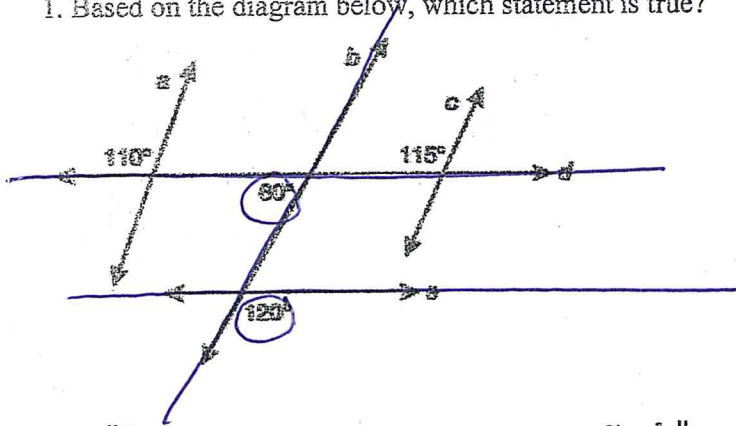


# Triangles/Parallel Lines Review Sheet Parallel Lines

1. Based on the diagram below, which statement is true?



- 1)  $a \parallel b$
- 2)  $a \parallel c$
- 3)  $b \parallel c$
- 4)  $a \parallel e$

Same angles (both acute or both obtuse)  
must be congruent

different angles (one acute and one obtuse)

must be supplementary (add to 180)

2. In  $\triangle ABC$ ,  $m\angle A = 3x + 1$ ,  $m\angle B = 4x - 17$ , and  $m\angle C = 5x - 20$ . Which type of triangle is  $\triangle ABC$ ?

- 1) right
- 2) scalene
- 3) isosceles
- 4) equilateral

$$3x + 1 + 4x - 17 + 5x - 20 = 180$$

$$\begin{array}{r} 12x - 36 = 180 \\ +36 \quad +36 \\ \hline 12x = 216 \\ \frac{12x}{12} = \frac{216}{12} \\ x = 18 \end{array}$$

The angles of a triangle add to 180

$$\begin{array}{l} 3(18) + 1 = 55 \\ 4(18) - 17 = 55 \\ 5(18) - 20 = 70 \end{array} \rightarrow \begin{array}{l} 2 \\ 2 \\ 2 \end{array} \equiv \text{angles}$$

3. Peach Street and Cherry Street are parallel. Apple Street intersects them, as shown in the diagram below.

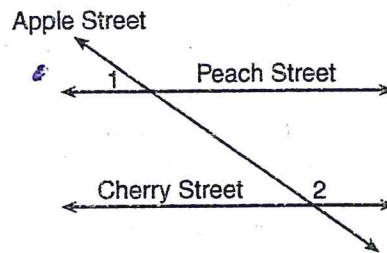
If  $m\angle 1 = 2x + 36$  and  $m\angle 2 = 7x - 9$ , what is  $m\angle 1$ ?

- 1) 9
- 2) 17
- 3) 54
- 4) 70

1 acute and 1 obtuse

$$2x + 36 + 7x - 9 = 180$$

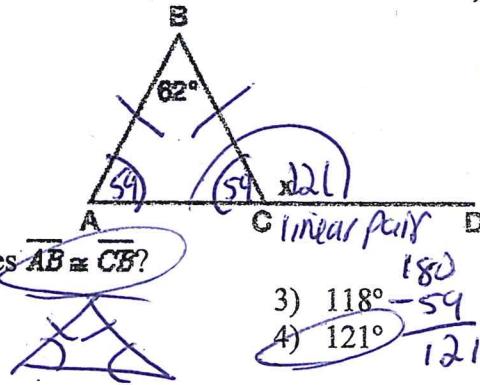
$$\begin{array}{r} 9x + 27 = 180 \\ -27 \quad -27 \\ \hline 9x = 153 \\ \frac{9x}{9} = \frac{153}{9} \\ x = 17 \end{array}$$



$$2(17) + 36 = 70$$

# Look for linear pairs/angles of a triangle

4. Given  $\triangle ABC$  with  $m\angle B = 62^\circ$  and side  $\overline{AC}$  extended to  $D$ , as shown below.



Angles of a triangle add to equal  $180^\circ$ .

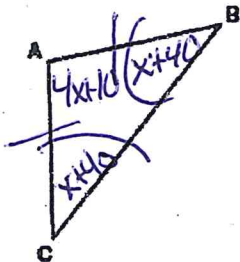
Which value of  $x$  makes  $\overline{AB} \cong \overline{CB}$ ?

- 1)  $59^\circ$
- 2)  $62^\circ$

- 3)  $118^\circ$
- 4)  $121^\circ$

$$\begin{aligned}
 x + x + 62 &= 180 \\
 2x + 62 &= 180 \\
 -62 &-62 \\
 \hline
 2x &= 118 \\
 \frac{2x}{2} &= \frac{118}{2} \\
 x &= 59
 \end{aligned}$$

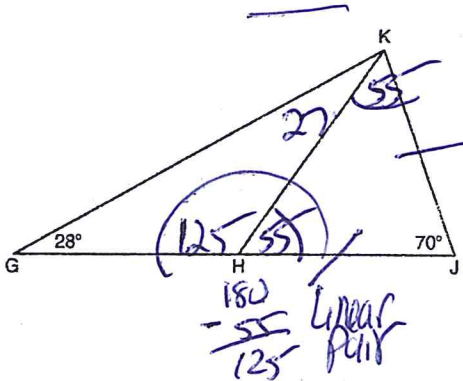
5. In the diagram of  $\triangle ABC$  below,  $\overline{AB} \cong \overline{AC}$ . The measure of  $\angle B$  is  $\angle B = x + 40$  and the measure of  $\angle A = 4x + 10$ . What is the measure of  $\angle A$ ?



$$\begin{aligned}
 x + 40 + x + 40 + 4x + 10 &= 180 \\
 6x + 90 &= 180 \\
 -90 &-90 \\
 \hline
 6x &= 90 \\
 \frac{6x}{6} &= \frac{90}{6} \\
 x &= 15
 \end{aligned}$$

$$\begin{aligned}
 4(15) + 10 &= 70 \\
 \text{m}\angle A &= 70^\circ
 \end{aligned}$$

6. In the diagram below of  $\triangle GJK$ ,  $H$  is a point on  $\overline{GJ}$ ,  $\overline{HJ} \cong \overline{JK}$ ,  $m\angle G = 28^\circ$ , and  $m\angle GJK = 70^\circ$ . Determine whether  $\triangle GHK$  is an isosceles triangle and justify your answer.



$$\begin{aligned}
 \triangle JKH \\
 x + x + 70 &= 180 \\
 2x + 70 &= 180 \\
 -70 &-70 \\
 \hline
 2x &= 110 \\
 \frac{2x}{2} &= \frac{110}{2} \\
 x &= 55
 \end{aligned}$$

$$\begin{aligned}
 \triangle GHK \\
 28 + 25 + x &= 180 \\
 153 + x &= 180 \\
 -153 &-153 \\
 \hline
 x &= 27
 \end{aligned}$$

$\triangle GHK$  is not isosceles. It is scalene because all of the angles are different. Isosceles triangles have two congruent angles.