

7.5

- ① False ② TRUE ③ No ④  $\angle BOA$  ⑤  $\angle BOA$  ⑥  $\angle DOC$

⑦  $4x - 1 + 2x + 15 = 8x + 8$

$$\begin{array}{r} 6x + 14 = 8x + 8 \\ -6x \quad -6x \\ \hline \end{array}$$

$$\begin{array}{r} 14 = 2x + 8 \\ -8 \quad -8 \\ \hline \end{array}$$

$$\frac{6}{2} = \frac{2x}{2}$$

$$3 = x$$

$$\begin{array}{r} 4(3) - 1 \\ 12 - 1 \\ 11^\circ \end{array}$$

$$\begin{array}{r} 2(3) + 15 \\ 6 + 15 \\ 21^\circ \end{array}$$

$$\begin{array}{r} 8(3) + 8 \\ 24 + 8 \\ 32^\circ \end{array}$$

⑧  $8x + 13 + 3x - 10 = 12x - 6$

$$\begin{array}{r} 11x + 3 = 12x - 6 \\ -11x \quad -11x \\ \hline \end{array}$$

$$\begin{array}{r} 3 = x - 6 \\ +6 \quad +6 \\ \hline \end{array}$$

$$9 = x$$

$$\begin{array}{r} 8(9) + 13 \\ 72 + 13 \\ 85^\circ \end{array}$$

$$\begin{array}{r} 3(9) - 10 \\ 27 - 10 \\ 17^\circ \end{array}$$

$$\begin{array}{r} 12(9) - 6 \\ 108 - 6 \\ 102^\circ \end{array}$$

⑨  $3x + 8 = 2x + 48$

$$\begin{array}{r} -2x \quad -2x \\ \hline x + 8 = 48 \\ -8 \quad -8 \\ \hline \end{array}$$

$$x = 40$$

$$\begin{array}{r} 3(40) + 8 \\ 120 + 8 \\ 128^\circ \end{array}$$

⑩

~~$2x + 3$~~

$$2x - 3 + 5x + 2 = 90^\circ$$

$$\begin{array}{r} 7x - 1 = 90^\circ \\ +1 \quad +1 \\ \hline \end{array}$$

$$\begin{array}{r} 7x = 91 \\ \frac{7x}{7} = \frac{91}{7} \\ \hline \end{array}$$

$$x = 13$$

$$\begin{array}{r} 2(13) - 3 \\ 26 - 3 \\ 23^\circ \end{array}$$

$$\begin{array}{r} 5(13) + 2 \\ 65 + 2 \\ 67^\circ \end{array}$$

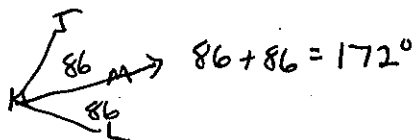
⑪ NO

⑫ Yes

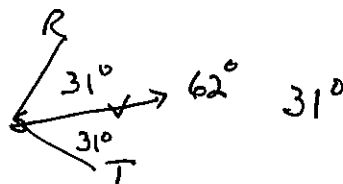
⑬ Yes

⑭ NO

⑮

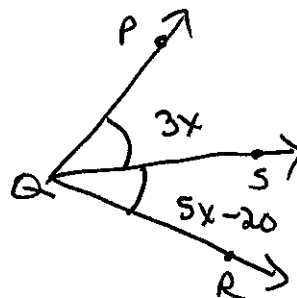


⑯



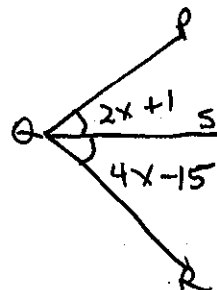
$$\begin{array}{r}
 3x = 5x - 20 \\
 -5x \quad -5x \\
 \hline
 -2x = -20 \\
 \frac{-2}{-2} \quad \frac{-2}{-2} \\
 \hline
 x = 10
 \end{array}$$

$$\begin{aligned}
 3(10) &= 30 \angle PQS \\
 \angle PQR &= 2(\angle PQS) \\
 &= 2(30) \\
 &= 60^\circ
 \end{aligned}$$



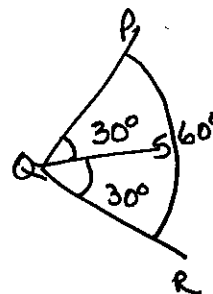
$$\begin{array}{r}
 2x + 1 = 4x - 15 \\
 -2x \quad -2x \\
 \hline
 1 = 2x - 15 \\
 +15 \quad +15 \\
 \hline
 16 = 2x \\
 \frac{16}{2} = \frac{2x}{2} \\
 \hline
 8 = x
 \end{array}$$

$$\begin{aligned}
 2(8) + 1 &= 17^\circ \\
 2(17) &= 34^\circ \angle PQR
 \end{aligned}$$

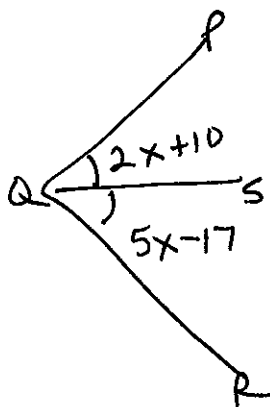


$$\begin{array}{r}
 3x - 12 = 2(30) \\
 3x - 12 = 60 \\
 +12 \quad +12 \\
 \hline
 3x = 72 \\
 \frac{3x}{3} = \frac{72}{3} \\
 \hline
 x = 24
 \end{array}$$

$$\begin{aligned}
 3(24) - 12 &= \\
 72 - 12 &= \\
 60^\circ & \\
 \angle PQR &
 \end{aligned}$$

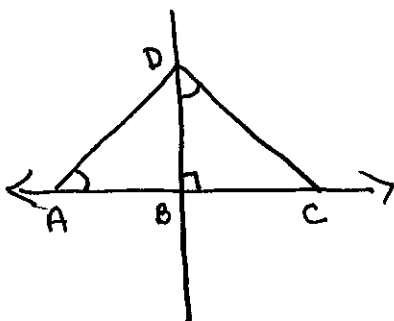


$$\begin{array}{r}
 2x + 10 = 5x - 17 \\
 -2x \quad -2x \\
 \hline
 10 = 3x - 17 \\
 +17 \quad +17 \\
 \hline
 27 = 3x \\
 \frac{27}{3} = \frac{3x}{3} \\
 \hline
 9 = x
 \end{array}$$



(21) Yes. They have the same markings.

(22) Yes.

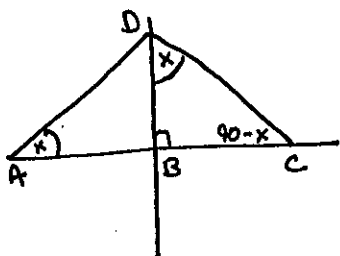


$$\angle DBC = 90^\circ$$

$\triangle DBC$  contains  $180^\circ$ , so if  $\angle DBC = 90^\circ$ , the other 2 angles share the other  $90^\circ$ .

$$\text{Let } x = m\angle BDC$$

$$\text{Then } 90 - x = m\angle DCB$$



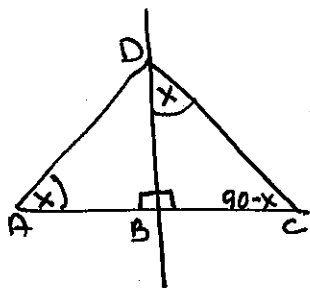
$$\text{So, if } m\angle BDC = x$$

the  $m\angle BAD = x$  because they are congruent

$m\angle DBA = 90^\circ$  because  $\overleftrightarrow{AC}$  is a straight angle which is  $180^\circ$ .

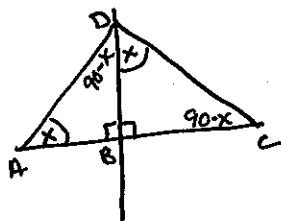
$$m\angle ABC = m\angle ABD + m\angle CBD$$

$$\begin{array}{r} 180 = m\angle ABD + 90 \\ - 90 \quad \quad - 90 \\ \hline 90 = m\angle ABD \text{ or } m\angle DBA \end{array}$$



$\triangle ABD$  contains  $180^\circ$ , so if  $\angle DBA = 90^\circ$ , the other two angles share  $90^\circ$ .

$$\text{Since } m\angle DAB = x, m\angle ADB = 90 - x$$



To be complementary,  $m\angle ABD + m\angle DCB = 90^\circ$

$$\text{So, } 90 - x + x = 90 \text{ must be true.}$$

$$90 - 0 = 90$$

$$90 = 90$$

✓

(23) No, there are no markings.

(24) Yes. See explanation for #22.

Also, if two <sup>pairs</sup> angles of two triangles are congruent, the third will be congruent also.