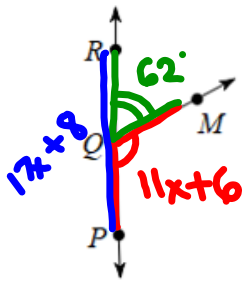
Line, Triangle, and Angle Properties

1) Find x if $m\angle MQP = 11x + 6$, $m\angle RQM = 62°$, and $m\angle RQP = 17x + 8$.

We know ∠MQP and ∠RQM combine to form ∠RQP.



$m\angle MQP + m\angle RQM = m\angle RQP$

$11x+6 + 62 = 17x+8$

$11x+68 = 17x+8$

$-11x \quad -11x$

$68 = 6x+8$

$-8 \quad -8$

$\frac{60}{6} = \frac{6x}{6}$

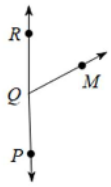
$x = 10$

Geometry Name_____

Line, Triangle, and Angle Properties

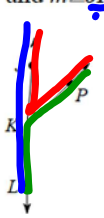
Date_____

1) Find x if $m\angle MQP = 11x + 6$, $m\angle RQM = 62°$, and $m\angle RQP = 17x + 8$.



$x = 10$

2) Find x if $m\angle JKP = 40x$, $m\angle PKL = 135°$, and $m\angle JKL = 174x + 1$.



$40x + 135 = 174x + 1$

$-40x \quad -40x$

$135 = 134x + 1$

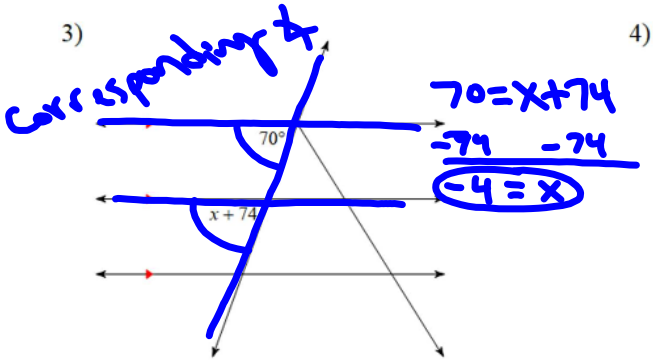
$-1 \quad -1$

$134 = 134x$

$x = 1$

Identify the property type and then solve for x.

3)



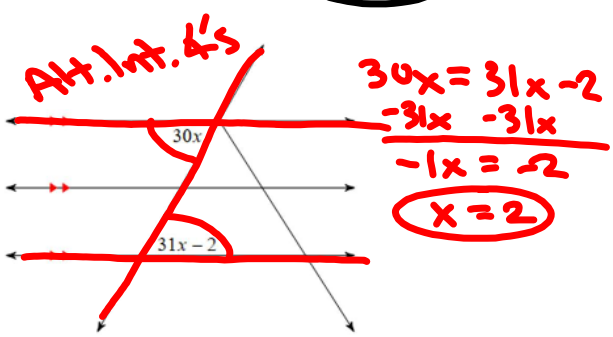
Corresponding ∠s

$70 = x + 74$

$-74 \quad -74$

$-4 = x$

4)



Alt. Int. ∠s

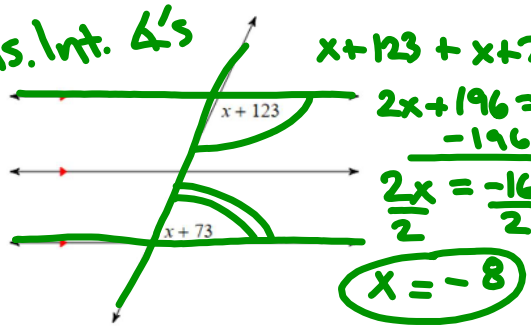
$30x = 31x - 2$

$-31x \quad -31x$

$-1x = -2$

$x = 2$

5)



Cons. Int. ∠s

$x + 123 + x + 73 = 180$

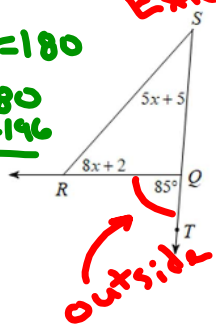
$2x + 196 = 180$

$-196 \quad -196$

$\frac{2x}{2} = \frac{-16}{2}$

$x = -8$

6)



Exterior ∠ Thm

$85 = 8x + 2 + 5x + 5$

$85 = 13x + 7$

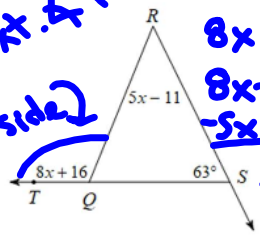
$-7 \quad -7$

$\frac{78}{13} = \frac{13x}{13}$

$6 = x$

outside

7) Ext. ∠ Thm.



outside

$8x + 16 = 5x - 11 + 63$

$8x + 16 = 5x + 52$

$-5x \quad -5x$

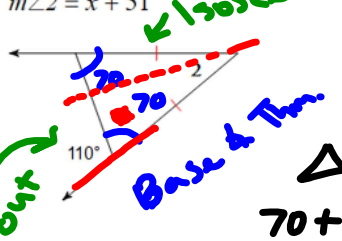
$3x + 16 = 52$

$-16 \quad -16$

$\frac{3x}{3} = \frac{36}{3}$

$x = 12$

8) $m\angle 2 = x + 51$



Isosceles

Linear Pair

$110 + \bullet = 180$

$-110 \quad -110$

$\bullet = 70$

out

Base ∠s Thm.

$x + 51 = 40$

$-51 \quad -51$

$x = -11$

△ Sum Thm.

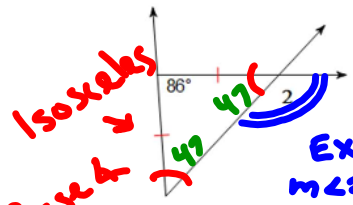
$70 + 70 + (x + 51) = 180$

$191 + x = 180$

$-191 \quad -191$

$x = -11$

9) $m\angle 2 = x + 139$



Isosceles → Base ∠s

180 − 86 = 94

$\frac{94}{2} = 47$

Ext. ∠ Thm.

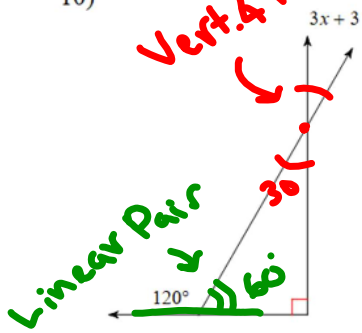
$m\angle 2 = 86 + 47$

$x + 139 = 133$

$-139 \quad -139$

$x = -6$

10)



Vert. ∠ Thm.

Linear Pair →

$3x + 3 = 30$

Triangle Sum

$90 + 3x + 3 + 60 = 180$

$153 + 3x = 180$

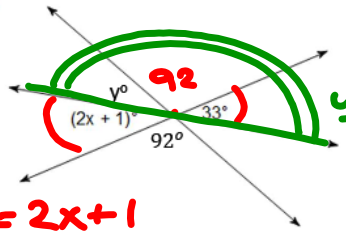
$-153 \quad -153$

$\frac{3x}{3} = \frac{27}{3}$

$x = 9$

Find the value(s) of the variable(s)

11)



$y + 92 + 33 = 180$

$y + 125 = 180$

$-125 \quad -125$

$y = 55$

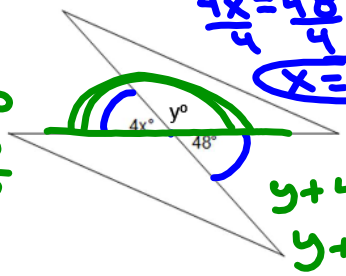
$33 = 2x + 1$

$-1 \quad -1$

$\frac{32}{2} = \frac{2x}{2}$

$x = 16$

12)



$\frac{4x}{4} = \frac{48}{4}$

$x = 12$

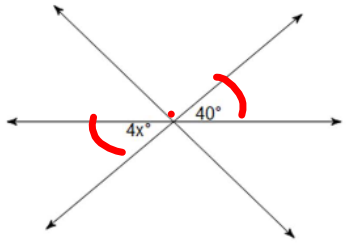
$y + 4(12) = 180$

$y + 48 = 180$

$-48 \quad -48$

$y = 132$

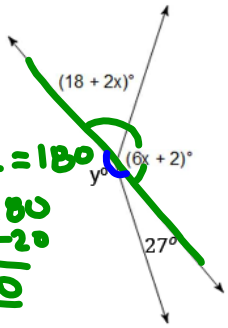
13)



$\frac{4x}{4} = \frac{40}{4}$

$x = 10$

14)



$18 + 2x + 6x + 2 = 180$

$8x + 20 = 180$

$-20 \quad -20$

$\frac{8x}{8} = \frac{160}{8}$

$x = 20$

$y + 27 = 180$

$-27 \quad -27$

$y = 153$

Geometry

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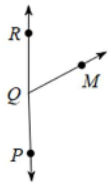

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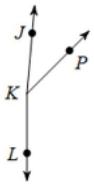
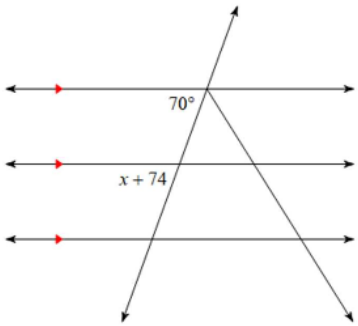
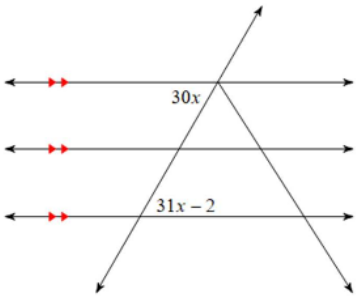


Identify the property type and then solve for x.

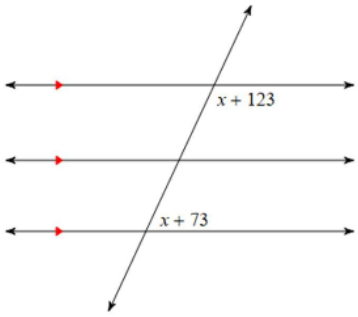
3)



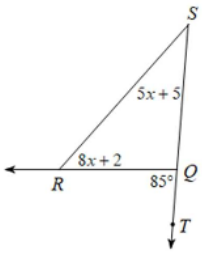
4)



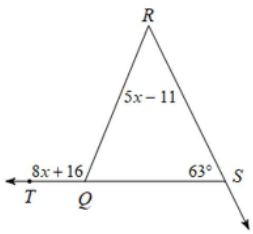
5)



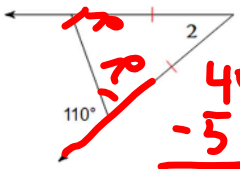
6)



7)



8) $m\angle 2 = x + 51$

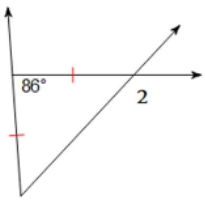


$40 = x + 51$

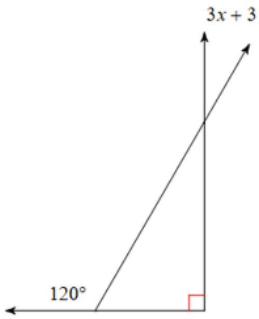
$-51 \quad -51$

$-11 = x$

9) $m\angle 2 = x + 139$



10)



Find the value(s) of the variable(s)

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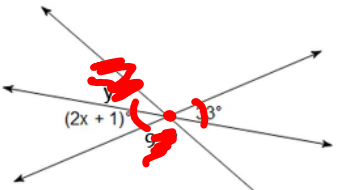


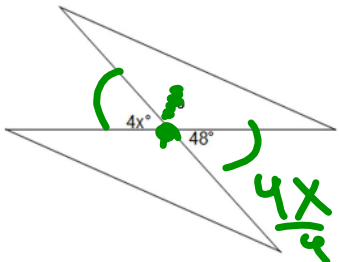
$33 = 2x + 1$

$-1 \quad -1$

$\frac{32}{2} = \frac{2x}{2}$

$16 = x$

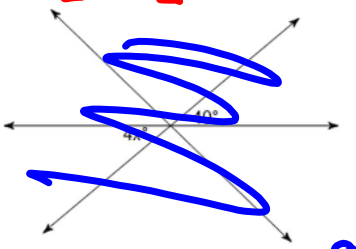
12)



$\frac{4x}{4} = \frac{48}{4}$

$x = 12$

13)



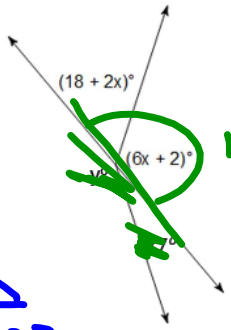
$109 + 17 + x = 180$

$126 + x = 180$

$-126 \quad -126$

$x = 54$

14)



$18 + 2x + 6x + 2 = 180$

$20 + 8x = 180$

$-20 \quad -20$

$\frac{8x}{8} = \frac{160}{8}$

$x = 20$