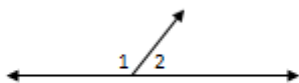


Supplementary:

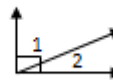
- 2 \angle s that sum to 180°
Ex: 110° and 70°
- 2 \angle s that form a straight \angle



$\angle 1$ is supplementary to $\angle 2$

Complementary:

- 2 \angle s that sum to 90°
Ex: 50° and 40°
- 2 \angle s that form a right \angle

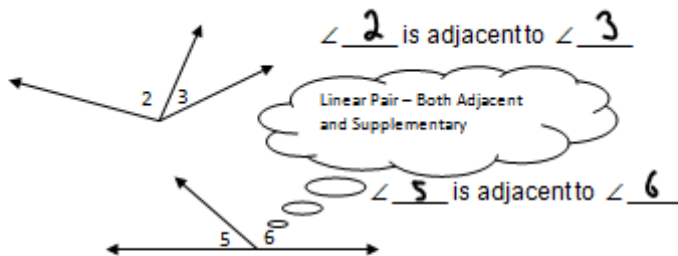


$\angle 2$ is complementary to $\angle 1$

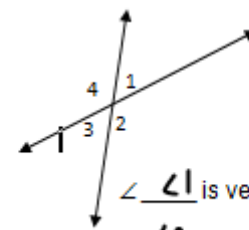
Angle Pairs

Adjacent: (next to)

2 non-overlapping \angle s with a common vertex and a common side (ray).



Vertical: 2 non-adjacent \angle s formed by intersecting lines.



$\angle 1$ is vertical to $\angle 3$

$\angle 2$ is vertical to $\angle 4$

- Vertical angles are 180°

Complementary Supplementary Vertical Adjacent Examples [Compatibility Mode] - Microsoft Word

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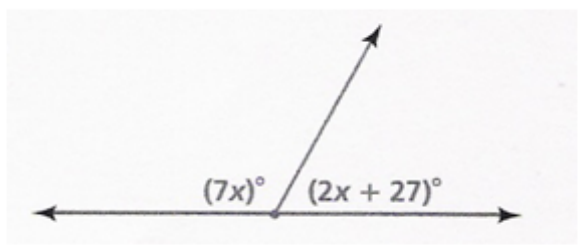
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Angle Pairs

DATE: 9/25

Directions: Write an equation and find the value of each variable.

Supplementary Angles

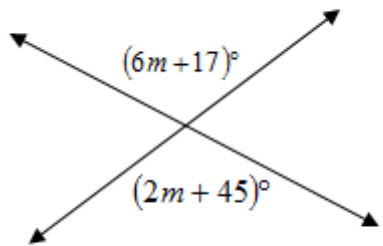


Equation: $7x + 2x + 27 = 180$ why?

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

Because supps add up to 180!

Vertical Angles



Equation: $6m + 17 = 2m + 45$ why?

$$\begin{aligned} 6m + 17 &= 2m + 45 \\ -2m \quad -2m & \\ \hline 4m + 17 &= 45 \\ -17 \quad -17 & \\ \hline 4m &= 28 \\ \frac{4}{4} \quad \frac{4}{4} & \\ \hline m &= 7 \end{aligned}$$

Because vertical \angle s are \cong !

Complementary Angles

Adjacent Angles

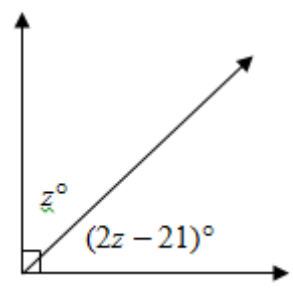
Complementary Supplementary Vertical Adjacent Examples [Compatibility Mode] - Microsoft Word

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Font: Arial, 12, Bold, Italic, Underline, Text Color, Background Color, Paragraph: Bullets, Numbered, Indent, Decrease Indent, Increase Indent, Paragraph Spacing, Line and Paragraph Spacing, Styles: Emphasis, Heading 1, Normal, Strong, Find, Replace, Select, Editing

Complementary Angles

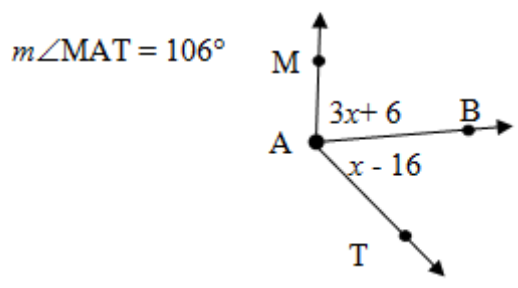


Equation: $z + 2z - 21 = 90$. why?

$$\begin{aligned} z + 2z - 21 &= 90 \\ 3z - 21 &= 90 \\ +21 \quad +21 & \\ \hline 3z &= 111 \\ \frac{3z}{3} &= \frac{111}{3} \\ z &= 37 \end{aligned}$$



Adjacent Angles



Equation: $3x + 6 + x - 16 = 106$ why?

$$\begin{aligned} 3x + 6 + x - 16 &= 106 \\ 4x - 10 &= 106 \\ +10 \quad +10 & \\ \hline 4x &= 116 \\ \frac{4x}{4} &= \frac{116}{4} \\ x &= 29 \end{aligned}$$

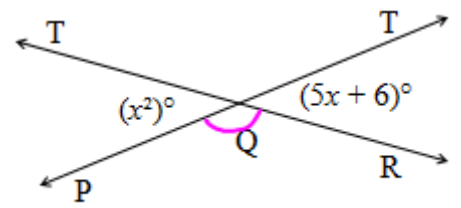


Complementary Supplementary Vertical Adjacent Examples [Compatibility Mode] - Microsoft Word

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Find two possible solutions for $\angle PQR$.



Vertical \angle s $\cong \Rightarrow$

$$\begin{array}{r} x^2 = 5x + 6 \\ -5x - 6 \quad -5x - 6 \\ \hline \end{array}$$

$$x^2 - 5x - 6 = 0$$

$$(x+1)(x-6) = 0$$

$$x+1=0 \text{ or } x-6=0$$

$$\begin{array}{r} -1-1 \\ \hline x=-1 \end{array} \quad \downarrow \quad \begin{array}{r} +6+6 \\ \hline x=6 \end{array}$$

$$\begin{array}{r} -6 \\ \uparrow \\ -6 \cdot 1 \\ \hline -6+1 = -5 \checkmark \end{array}$$

$x=-1$: $m\angle TQP =$
 $x^2 = (-1)^2 = 1$
 So $m\angle PQR =$
 $180 - 1 = 179^\circ$
 1st solution

$x=6$:
 $m\angle TQP = x^2$
 $= 6^2 = 36$. So
 $m\angle PQR =$
 $180 - 36 = 144$
 2nd solution

Suppose $\overline{AB} \perp \overline{CB}$. The $m\angle ABC = 18x + 20$.
 Solve for x .

$$\overrightarrow{AB} \perp \overrightarrow{CB} \Rightarrow \angle ABC = \text{rt. } \angle = 90^\circ$$

\therefore Equation: $18x + 20 = 90$

$$\begin{array}{r} -20 \quad -20 \\ \hline 18x = 70 \div 2 \\ \hline 18 \quad 18 \div 2 \end{array}$$

$x = \frac{35}{9} \checkmark$

Suppose $\angle B$ and $\angle C$ are supplementary. Find their measures if $m\angle B = 25x + 30$ and $m\angle C = 5x + 60$.

Suppose \overline{MN} bisects $\angle RMQ$. $m\angle RMN = x + 20$ and $m\angle NMQ = 2x - 30$. Draw a diagram to represent this situation.

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Suppose $\angle B$ and $\angle C$ are supplementary.
 Find their measures if $m\angle B = 25x + 30$ and $m\angle C = 5x + 60$.

$$\angle B, \angle C \text{ Supp.} \Rightarrow \angle B + \angle C = 180.$$

$$\therefore 25x + 30 + 5x + 60 = 180$$

$$30x + 90 = 180$$

$$-90 \quad -90$$

$$30x = 90$$

$$\underline{\quad} \quad \underline{\quad}$$

$$x = 3$$

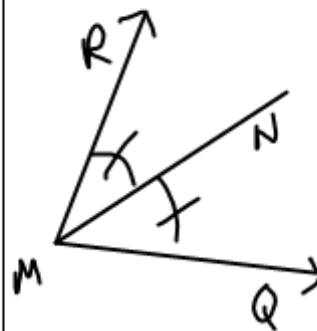
$$\text{So } \angle B = 25x + 30 = 25(3) + 30 = 105^\circ \checkmark$$

$$\angle C = 5x + 60 = 5(3) + 60 = 75^\circ \checkmark$$

Suppose \overline{MN} bisects $\angle RMQ \Rightarrow \angle RMN \cong \angle NMQ$

$m\angle RMN = x + 20$ and $m\angle NMQ = 2x - 30$.

Draw a diagram to represent this situation.
 Then find the value of x and $m\angle RMQ$.



$$\text{Eq: } x + 20 = 2x - 30$$

$$-x \quad -x$$

$$20 = x - 30$$

$$+30 \quad +30$$

$$50 = x$$

$$\text{So } \angle RMQ = \angle RMN + \angle NMQ$$

$$= x + 20 + 2x - 30$$

$$= \underset{\downarrow}{50} + 20 + 2(\underset{\downarrow}{50}) - 30$$

$$= 140^\circ \checkmark$$