

Lesson 2.2 Angle Relationships

Tuesday, September 29, 2026 8:17 AM

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PowerPoint Lesson:

<https://app.peardeck.com/student/tquljcidf>



Lesson 2.2 Angle Relationships



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Workbook pages 71-74

MA.912.GR.1.1

Prove relationships and theorems about lines and angles.
Solve mathematical and real-world problems involving
postulates, relationships and theorems of lines and angles.

Content Objective

Students use the properties of perpendicular lines to find the
measures of angles.



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90

180

Learn

Complementary and Supplementary Angles

Complementary and Supplementary Angles

Complementary Angles

90

Definition

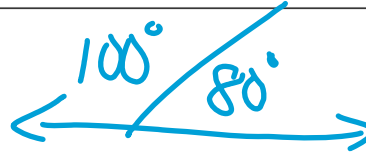
two angles with measures that have a sum of 90°



Supplementary Angles

180

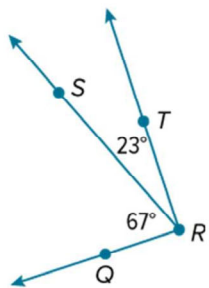
two angles with measures that have a sum of 180°



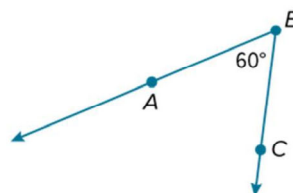
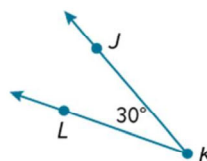
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Complementary and Supplementary Angles

Examples of Complementary Angles



$$\begin{aligned} m\angle QRS + m\angle SRT &= 90^\circ \\ 67^\circ + 23^\circ &= 90^\circ \end{aligned}$$

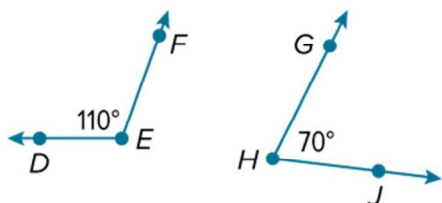


$$\begin{aligned} m\angle JKL + m\angle ABC &= 90^\circ \\ 30^\circ + 60^\circ &= 90^\circ \end{aligned}$$

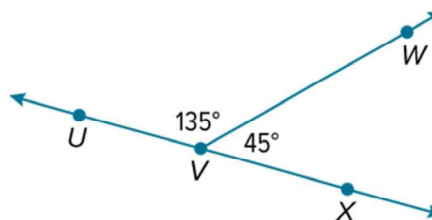
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Complementary and Supplementary Angles

Examples of Supplementary Angles



$$\begin{aligned} m\angle DEF + m\angle GHJ &= 180^\circ \\ 110^\circ + 70^\circ &= 180^\circ \end{aligned}$$

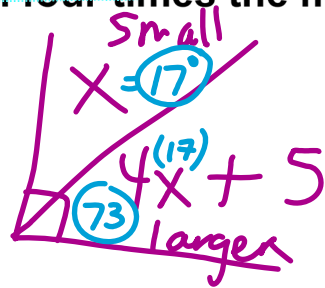


$$\begin{aligned} m\angle UVW + m\angle WVX &= 180^\circ \\ 135^\circ + 45^\circ &= 180^\circ \end{aligned}$$

Example 1

Complementary and Supplementary Angles

Find the measures of two complementary angles if the measure of the larger angle is five more than four times the measure of the smaller angle.



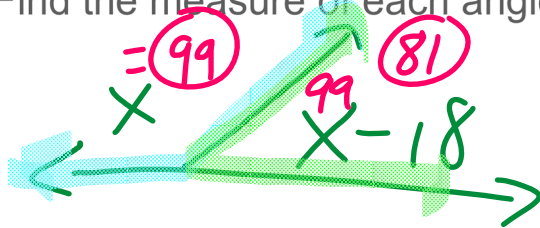
$$\begin{aligned} 1x + 4x + 5 &= 90 \\ 5x + 5 &= 90 \\ -5 &-5 \\ \hline 5x &= 85 \\ \frac{5x}{5} &= \frac{85}{5} \end{aligned} \quad \begin{aligned} &17^\circ \\ &x = 17 \end{aligned}$$

Example 1

Complementary and Supplementary Angles

Check

-18 The difference between the measures of two supplementary angles is 18°. Find the measure of each angle.



$$\begin{aligned} &180 \\ &X + X - 18 = 180 \\ &2X - 18 = 180 \\ &\quad +18 \quad +18 \\ &\hline &2X = 198 = 99 \end{aligned}$$

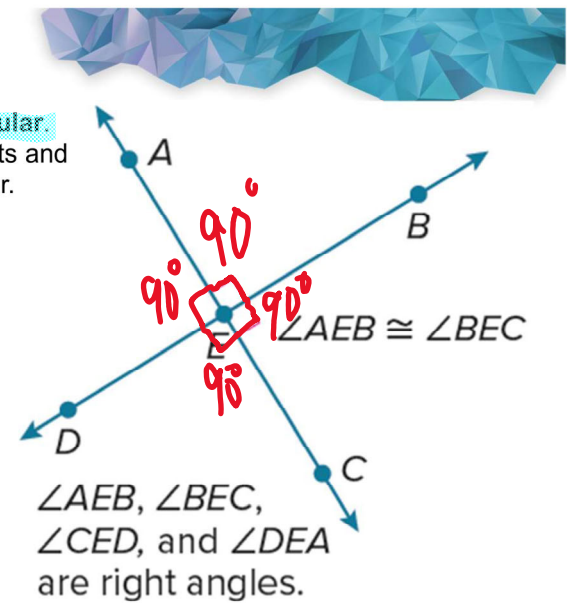
Learn

Perpendicularity

Lines, segments, or rays that intersect at right angles are perpendicular. Segments or rays can be perpendicular to lines or other line segments and rays. The right angle symbol indicates that the lines are perpendicular.

Perpendicular lines intersect to form four right angles.

Perpendicular lines intersect to form congruent adjacent angles.



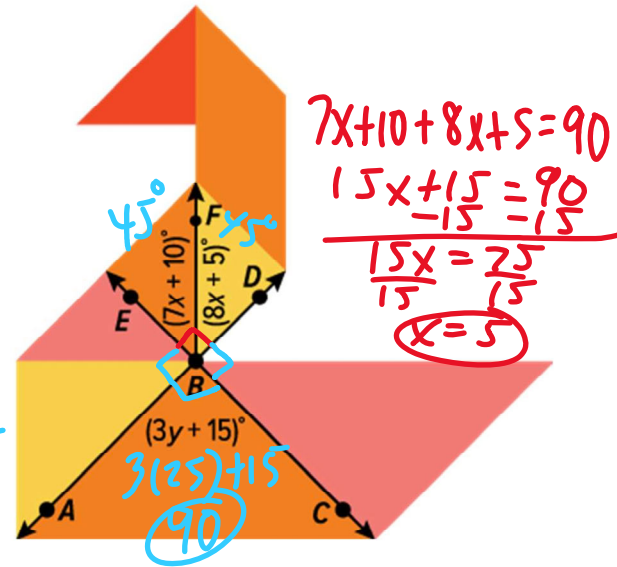
Perpendicular Lines

TANGRAMS The tangram is a puzzle consisting of eight flat shapes called *tans* which are put together to form images. Find the values of x and y such that $\overrightarrow{AD}$ and $\overrightarrow{EC}$ in the tangram are perpendicular.

 90°

$$y = 25$$

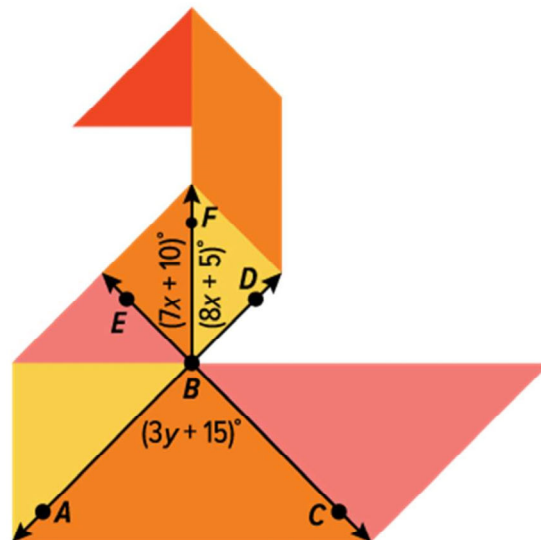
$$\begin{array}{r} 3y + 15 = 90 \\ \underline{-15 \quad -15} \\ 3y = 75 \\ \underline{\quad \quad 3} \end{array}$$



Example 2

Perpendicular Lines

If $\overleftrightarrow{AD}$ and $\overleftrightarrow{EC}$ are perpendicular, then
 $m\angle ABC = 90^\circ$ and $m\angle EBD = 90^\circ$.



Example 2

Perpendicular Lines

Check

DESIGN Find the values of x and y such that $\overrightarrow{PR}$ and $\overrightarrow{QS}$ are perpendicular.

$$\begin{aligned} 90^\circ \quad 5x + 6 + 2x &= 90 \\ 7x + 6 &= 90 \\ \underline{-6 \quad -6} & \\ 7x &= 84 \\ \underline{7 \quad 7} & \\ x &= 12 \end{aligned}$$
$$\begin{aligned} 4y - 2 &= 90 \\ \underline{+2 \quad +2} & \\ 4y &= 92 \\ \underline{4 \quad 4} & \\ y &= 23 \end{aligned}$$

