

Name: _____

Grade: _____

Score: _____

Worksheet #5



LINEAR PAIRS & ADJACENT ANGLES

Learning goal: Students will be able to combine adjacent angle and linear pair concepts to solve problems and analyze complex angle relationships in real-world systems

PROBLEM SCENARIO	STEPS & SOLUTION
A folding chair's legs form adjacent angles of 75° and x° when open. When fully collapsed, they create a linear pair with the seat. Find x° and the collapsed angle.	
Two roads intersect, forming adjacent angles of 50° and y° . The opposite side forms a linear pair with y° . Find all angles.	
At 2:20, the hour and minute hands form adjacent angles. The minute hand creates a linear pair with the 12. Find both angles.	
A roof truss has adjacent angles of 40° and z° . The opposite side completes a linear pair. Find z° and the roof peak angle.	
Open scissors form adjacent angles of 30° (between handles) and a° (between blades). The blade angle forms a linear pair with the handle angle. Find a° .	
A bench's backrest forms a 110° angle with the seat. The support brace creates an adjacent angle of b° . The brace's other side forms a linear pair. Find b° and the brace angle.	
A table's folded leaf creates adjacent angles of 25° and c° . The support leg forms a linear pair with c° . Find c° and the leg angle.	
Bridge Support Cables A cable makes a 40° angle with the deck. Its adjacent angle (d°) connects to a tower. The tower's other side forms a linear pair. Find d° and the tower angle.	
Art Easel Setup An easel's legs form adjacent angles of 55° and e° . The back leg forms a linear pair with the ground. Find e° and the ground angle.	
Sailboat Rigging A sail's mast and boom form adjacent angles of 60° and f° . The boom's rope forms a linear pair with f° . Find f° and the rope angle.	

Name:

Grade:

Score:

Worksheet #5



LINEAR PAIRS & ADJACENT ANGLES

Learning goal: Students will be able to combine adjacent angle and linear pair concepts to solve problems and analyze complex angle relationships in real-world systems

PROBLEM SCENARIO	STEPS & SOLUTION
A folding chair's legs form adjacent angles of 75° and x° when open. When fully collapsed, they create a linear pair with the seat. Find x° and the collapsed angle.	<p>Adjacent angles sum to seat angle: $75^\circ + x^\circ = 90^\circ$ $x = 15^\circ$.</p> <p>Collapsed position: Linear pair with seat $180^\circ - 90^\circ = 90^\circ$ (total angle between legs).</p>
Two roads intersect, forming adjacent angles of 50° and y° . The opposite side forms a linear pair with y° . Find all angles.	<p>Adjacent angles at intersection: $50^\circ + y^\circ = 180^\circ$ $y^\circ = 130^\circ$.</p> <p>Opposite side: Linear pair: $180^\circ - 130^\circ = 50^\circ$ (vertically opposite angles are equal).</p>
At 2:20, the hour and minute hands form adjacent angles. The minute hand creates a linear pair with the 12. Find both angles.	<p>Minute hand at 120° (20 min $\times 6^\circ/\text{min}$).</p> <p>Hour hand moves 10° (20 min $\times 0.5^\circ/\text{min}$) 70° from 12</p> <p>Adjacent angle: $120^\circ - 70^\circ = 50^\circ$</p> <p>Linear pair with 12: $180^\circ - 120^\circ$ $= 60^\circ$.</p>
A roof truss has adjacent angles of 40° and z° . The opposite side completes a linear pair. Find z° and the roof peak angle.	<p>Adjacent angles: $40^\circ + z^\circ = 180^\circ$ $z^\circ = 140^\circ$.</p> <p>Linear pair $180^\circ - 140^\circ$ $= 40^\circ$ (isosceles triangle symmetry).</p>

Open scissors form adjacent angles of 30° (between handles) and $\angle a$ (between blades). The blade angle forms a linear pair with the handle angle. Find $\angle a$.	<p>Adjacent handle angle: $180^\circ - 30^\circ = 150^\circ$ Blade angle ($\angle a$): Linear pair $\rightarrow 180^\circ - 150^\circ$ $= 30^\circ$ (equal to handle angle).</p>
A bench's backrest forms a 110° angle with the seat. The support brace creates an adjacent angle of $\angle b$. The brace's other side forms a linear pair. Find $\angle b$ and the brace angle.	<p>Adjacent angle: $180^\circ - 110^\circ = 70^\circ$ Brace's linear pair: $180^\circ - 70^\circ = 110^\circ$ (matches seat angle).</p>
A table's folded leaf creates adjacent angles of 25° and $\angle c$. The support leg forms a linear pair with $\angle c$. Find $\angle c$ and the leg angle.	<p>Adjacent angles: $25^\circ + \angle c = 90^\circ$ $\angle c = 65^\circ$. Leg angle: Linear pair $180^\circ - 65^\circ = 115^\circ$.</p>
Bridge Support Cables A cable makes a 40° angle with the deck. Its adjacent angle ($\angle d$) connects to a tower. The tower's other side forms a linear pair. Find $\angle d$ and the tower angle.	<p>Adjacent angle: $180^\circ - 40^\circ = 140^\circ$ ($\angle d$). Tower angle: Linear pair : $180^\circ - 140^\circ$ $= 40^\circ$</p>
Art Easel Setup An easel's legs form adjacent angles of 55° and $\angle e$. The back leg forms a linear pair with the ground. Find $\angle e$ and the ground angle.	<p>Adjacent angles: $55^\circ + \angle e = 180^\circ$ $\angle e = 125^\circ$. Ground angle: Linear pair $180^\circ - 125^\circ$ $= 55^\circ$</p>
Sailboat Rigging A sail's mast and boom form adjacent angles of 60° and $\angle f$. The boom's rope forms a linear pair with $\angle f$. Find $\angle f$ and the rope angle.	<p>Adjacent angles: $60^\circ + \angle f = 90^\circ$ $\angle f = 30^\circ$. Rope angle: Linear pair $180^\circ - 30^\circ = 150^\circ$.</p>