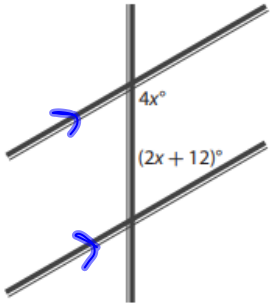
Bell Work

1. **Engineering** An overpass intersects two lanes of a highway. What must the value of x be to ensure the two lanes are parallel?



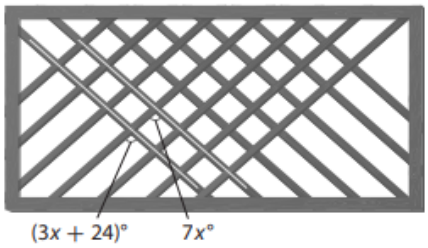
$4x + 2x + 12 = 180$

$6x + 12 = 180$ $\quad x = 28$

$-12 \quad -12$

$\frac{6x}{6} = \frac{168}{6}$

2. A trellis consists of overlapping wooden slats. What must the value of x be in order for the two slats to be parallel?



$3x + 24 = 7x$

$-3x \quad -3x$

$\frac{24}{4} = \frac{4x}{4}$

$x = 6$

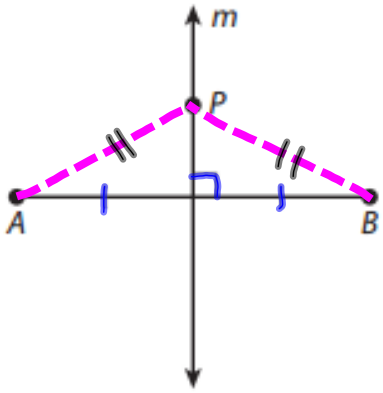
4.4 Perpendicular Bisectors

4.5 Equations of perpendicular lines

Essential Question: What are the key ideas about perpendicular bisectors of a segment?

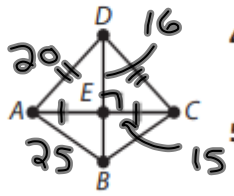
Perpendicular Bisector Theorem- If a point is on the perpendicular bisector of a segment, then it is equidistant from the endpoints of the segment

PA = PB



Indirect Proof- a proof in which the statement to be proved is assumed to be false and a contradiction is shown

Use the diagram shown. $\overline{BD}$ is the perpendicular bisector of $\overline{AC}$. pg. 197



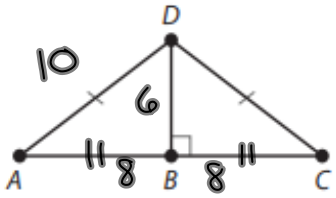
4. Suppose $ED = 16$ cm and $DA = 20$ cm. Find DC.

20 cm

5. Suppose $EC = 15$ cm and $BA = 25$ cm. Find BC.

25 cm

7. $\overline{AD}$ is 10 inches long. $\overline{BD}$ is 6 inches long. Find the length of $\overline{AC}$.



$AC = 8 + 8 = 16$

$a^2 + b^2 = c^2$

$c^2 + (6)^2 = (10)^2$ $\quad a = 8$

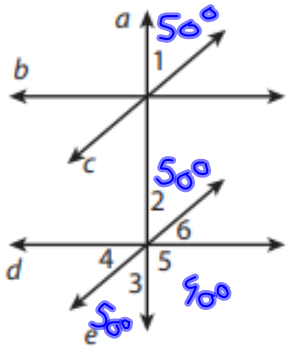
$a^2 + 36 = 100$

$-36 \quad -36$

$a^2 = 64$

9. Given: $b \parallel d$, $c \parallel e$, $m\angle 1 = 50°$, and $m\angle 5 = 90°$. Use the diagram to find $m\angle 4$.

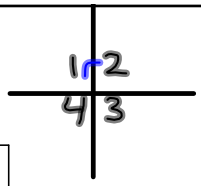
Parallel



$90 - 50$

$40°$

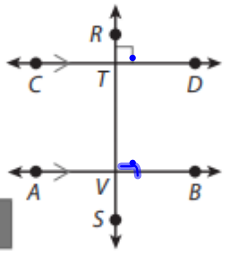
Given: $m\angle 1 = 90°$ Prove: $m\angle 2 = 90°, m\angle 3 = 90°, m\angle 4 = 90°$



Statements	Reasons
1. $m\angle 1 = 90°$	1. Given
2. $\angle 1$ and $\angle 2$ are a linear pair	2. Given
3. $\angle 1$ and $\angle 2$ are supplementary	3. Linear Pair Theorem
4. $m\angle 1 + m\angle 2 = 180°$	4. Def. of Supplementary Ang.
5. $90° + m\angle 2 = 180°$	5. Substitution PoE
① 6. $m\angle 2 = 90°$	6. Subtraction PoE
7. $m\angle 2 = m\angle 4$	7. Vertical Angles The.
② 8. $m\angle 4 = 90°$	8 Substitution PoE
9. $m\angle 1 = m\angle 3$	9. Vertical Ang. The.
10. $m\angle 3 = 90°$	10. Subst./Tran. PoE

pg. 203

18. Justify Reasoning Prove the theorem: In a plane, if a transversal is perpendicular to one of two parallel lines, then it is perpendicular to the other.



Given: $\overline{RS} \perp \overline{CD}$ and $\overline{AB} \parallel \overline{CD}$ Prove: $\overline{RS} \perp \overline{AB}$

Statements	Reasons
1. $\overline{AB} \parallel \overline{CD}$	Given
2. $m\angle RTD = m\angle RVB$	Corresponding Ang. The.
3. $\overline{RS} \perp \overline{CD}$	Given
4. $m\angle RTD = 90°$	Def. of Perpendicular Lines
5. $m\angle RVB = 90°$	Correspond./Subs./Trans.
6. $\overline{RS} \perp \overline{AB}$	Def. of Perp.

4.5 Equations of Perp. Lines

What are the differences in parallel and perpendicular lines?

Parallel	Perpendicular
Never Intersect	Intersect at 90° angle
Same Slope	Opposite Reciprocal Slope (change sign, flip fraction)
Different y-int	Can have same y-int

Write the equation of the line perpendicular to $y = (3/2)x + 2$ that passes through $(3,-1)$.

$x \quad y$

$y = mx + b$

$(-1) = (-\frac{2}{3})(3) + b$

$-1 = -2 + b$

$+2 \quad +2$

$1 = b$

$\frac{3}{2} \rightarrow \boxed{-\frac{2}{3}}$

$y = -\frac{2}{3}x + 1$

Write the equation of the line perpendicular to y = -4x and passes through the point (0,0).

x y

$y = mx + b$

$0 = \left(\frac{1}{4}\right)0 + b$

$0 = b$

$y = \frac{1}{4}x$

$\frac{-4}{1} \rightarrow \frac{1}{4}$

pg. 200-201 # 5-13

pg. 209-210 #8-10,13,14

pg. 191-192 #4-10

pg. 209-210 #5-7, 12, 15

pg. 169 #1-5

pg. 181-182 #3-15

Construct Perpendicular Bisector

https://youtu.be/WR2R_wrdEVY