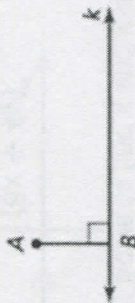


Lesson Title 3.4 Perpendicular Lines DAY ONE Notes

HGEO Date

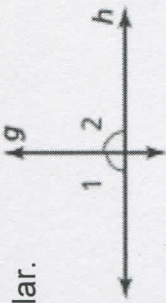
The distance from a point to a line is the length of the perpendicular segment from the point to the line. It is also the **SHORTEST** distance.



distance from a point to a line

LINE PAIR PERPENDICULAR THEOREM:

If two lines intersect to form a linear pair of congruent angles, then the lines are perpendicular.

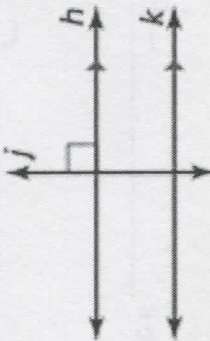


TASK 1:

$\text{If } \angle 1 \cong \angle 2, \Rightarrow g \perp h.$

PERPENDICULAR TRANSVERSAL THEOREM:

In a plane, if a transversal is perpendicular to one of two parallel lines, then it is perpendicular to the other line.



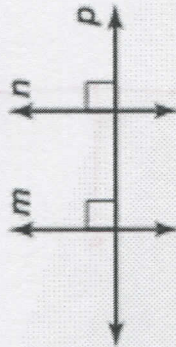
TASK 2:

$\text{If } h \parallel k \ \& \ j \perp h, \Rightarrow j \perp k.$

LINES PERPENDICULAR TO A TRANSVERSAL

THEOREM:

In a plane, if two lines are perpendicular to the same line, then they are parallel to each other.



TASK 3:

$\text{If } m \perp p \ \& \ n \perp p, \Rightarrow m \parallel n.$

TASK 4: Carpentry Application

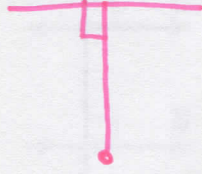
A carpenter's square forms a right angle. A carpenter places the square so that one side is parallel to an edge of a board, and then draws a line along the other side of the square. Then he slides the square to the right and draws a second line. Why must the two lines be parallel?



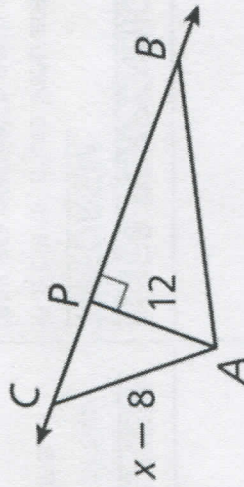
\leftrightarrow \perp Transversal \Rightarrow \parallel

TASK 5: Perpendicular Lines

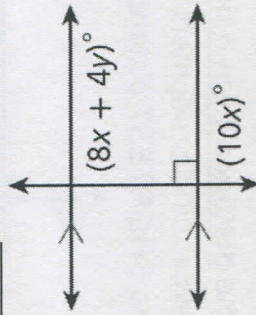
The shortest segment from a point to a line is \perp to the line.



- a) Fill in the blank above.
- b) Name the shortest segment from A to \overline{BC} .
 \overline{AP} or \overline{PA}
- c) Write **AND** solve an inequality for x.
 $12 < x - 8$ $x > 20$



TASK 6: Solve to find x and y using the diagram.



Still need help with:

$$\begin{aligned} 8x + 4y &= 10x \\ 4y &= 2x \\ 2y &= x \end{aligned}$$

$$\begin{aligned} 90 &= 10x \\ 9 &= x \\ 2y &= 9 \\ y &= \frac{9}{2} \end{aligned}$$