

Illustrative Mathematics

8.G Find the Missing Angle

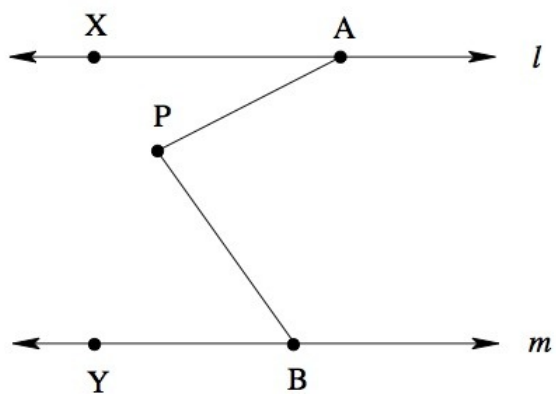
Alignments to Content Standards

- [Alignment: 8.G.A.5](#)

Tags

- *This task is not yet tagged.*

In the picture below, lines l and m are parallel. The measure of angle $\angle PAX$ is 31° , and the measure of angle $\angle PBY$ is 54° . What is the measure of angle $\angle APB$?



Commentary

This task provides us with the opportunity to see how the mathematical ideas embedded in the standards and clusters mature over time. The task "Uses facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure (7.G.5)" except that it requires students to know, in addition, something about parallel lines, which students will not see until 8th grade. As a result, this task is especially good at illustrating the links between related standards across grade levels.

Solutions

Solution: solution

Extend line AP to intersect line m at point Z .

Since m and ℓ are parallel, the alternate interior angles ZAX and AZB have the same measure 31° .

Angle PBZ (which is the same angle as PBY) is given to have measure 54° .

Since the sum of the angles of a triangle is 180° and the sum of AZB and PBZ is $31^\circ + 54^\circ = 85^\circ$, angle ZPB measures $180^\circ - 85^\circ = 95^\circ$.

ZPB and APB together form a straight angle, so their sum is 180° . So APB measures $180^\circ - 95^\circ = 85^\circ$.

One could also extend BP to meet ℓ and proceed similarly.



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