Applications of Primary Trig Ratios

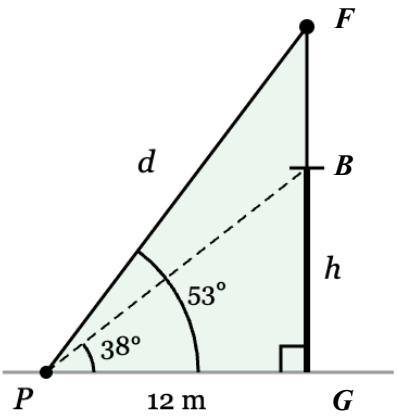
Recall: $\sin\theta = \frac{\text{opp}}{\text{hyp}}$ $\cos\theta = \frac{\text{adj}}{\text{hyp}}$ $\tan\theta = \frac{\text{opp}}{\text{adj}}$

Remember, you often need to work backwards from what you can find *now*, given the initial information. After that initial step, you will typically have the information required to find what you actually *want*.

1. From a point P on the ground, 12 m from the base of a building, the angle of elevation to the roof is $38°$ and the angle of elevation to the top of a flagpole mounted on the roof is $53°$.

   a) Find h, the height of the roof above the ground.

   b) Find d, the straight-line distance from P to the top of the flagpole.



2. A helicopter hovers 200 m directly above a landmark on the ground. The pilot looks down and spots two ends of a runway. The angle of depression to the **near end** of the runway is $52°$. The angle of depression to the **far end** of the runway is $38°$.

   a) Sketch and label a diagram. Mark both angles of depression clearly, using a horizontal reference line from the helicopter.

   b) Find the horizontal distance from the landmark to the near end of the runway.

   c) Find the straight-line distance from the helicopter to the far end of the runway.