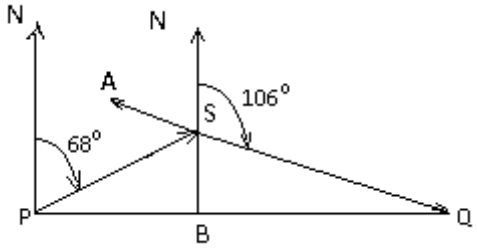
Answer on question #72638 - Math - Trigonometry

A ship leaves a port P end sails for 12 km on a bearing 068. It then sails a further 20 km on bearing of 106 to reach Q. What is the distance between P and Q. What is the bearing of Q from P.

Solution



The angle PSQ=180-(106-68)=144 degree.

The angle ASN = 180-106=74 degree

The angle BSQ = the angle ASN =74 degree

The angle BQS = 180 - 90-74 = 16 degree

The angle SPQ=180-144-16=20 degree

The angle QPN = NPS+CPQ=68+20=88 degree

$|PQ|^2=|PS|^2+|SQ|^2-2*|PS|*|SQ|*\cos(PSQ)=20^2+12^2-2*12*20*\cos(144)=400+144-480*(-0.809)=544+388=932$. $|PQ|=SQR(932)=30.53$ km.

Answer

|PQ|=30.53 km. The angle QPN = 88 degree