

Mathematics Questions by Topic

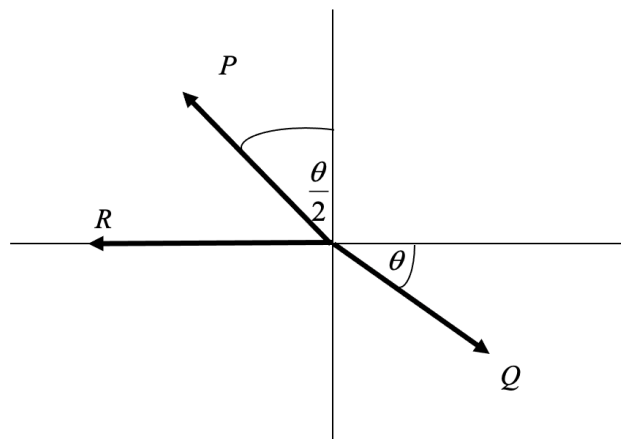
Motion and Force

Answer 8

Source: K19SM2Q12

Question 8

Three coplanar forces of magnitudes P , Q and R newtons act on a particle that is in equilibrium as shown in the diagram below.



Then,

- A. $P \sin\left(\frac{\theta}{2}\right) = Q \cos(\theta)$
- B. $P \cos\left(\frac{\theta}{2}\right) + R = Q \sin(\theta)$
- C. $P = Q \sin\left(\frac{\theta}{2}\right)$
- D. $P = 2Q \sin\left(\frac{\theta}{2}\right)$
- E. $P + Q + R = 0$

ANSWER D

resolving horizontally $P \sin\left(\frac{\theta}{2}\right) + R = Q \cos(\theta)$

resolving vertically $P \cos\left(\frac{\theta}{2}\right) = Q \sin(\theta) = 2Q \sin\left(\frac{\theta}{2}\right) \cos\left(\frac{\theta}{2}\right)$

therefore $P = 2Q \sin\left(\frac{\theta}{2}\right)$