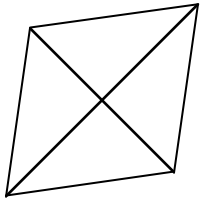
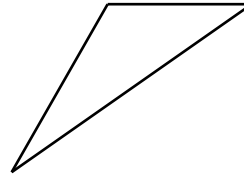


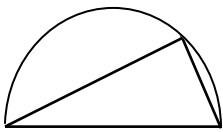
1. Use vectors to prove that the diagonals of a rhombus are perpendicular.



2. Use vectors to prove the cosine rule.

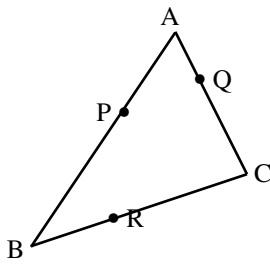


3. Use vectors to prove that the angle subtended by the diameter of a semi-circle is a right angle.

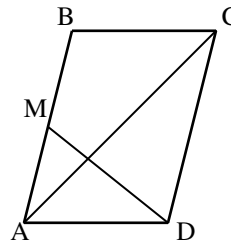


4. If two linearly independent vectors are of equal magnitude, prove that their sum is perpendicular to their difference.

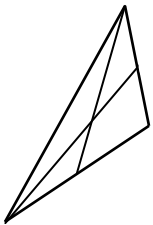
5. P, Q and R are points of trisection of sides AB, AC and BC respectively. Use vectors to show that BPQR is a parallelogram.



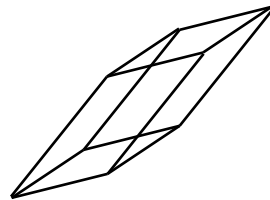
6. ABCD is a parallelogram. M is the midpoint of AB. Use vectors to show that DM and AC trisect each other.



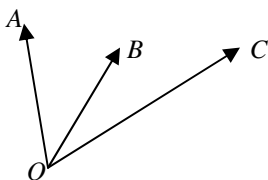
7. Use vectors to show that any two medians of a triangle trisect each other.



8. Use vectors to show that any two body diagonals of a parallelepiped bisect each other.



9. Given  $\vec{OA} = 10\mathbf{a}$ ,  $\vec{OB} = 6(\mathbf{a} + \mathbf{b})$  and  $\vec{OC} = 15\mathbf{b}$ . Show that points A, B and C are collinear.



10. Use vectors to prove that the midpoints of the sides of a quadrilateral are the vertices of a parallelogram.

