<u>Vectors</u>

- 1. Work out the magnitude of the vector 2i 3j + 4k.
- 2. P, Q and R have the coordinates (2, -4, 5), (3, 1, 3) and (6, 16, -3) respectively.
 - a) Write down the components of \overrightarrow{PQ} .
 - b) Hence show that the points P, Q and R are collinear.
- 3. The point S divides \overrightarrow{XY} in the ratio 3:2. Find the coordinates of S.
- 4. Prove that the triangle XYZ is right-angled at Y.



5. In triangle FGH, F has coordinates (2, 3, 1), G is (5, -2, 3) and H is (-1, 0, 3). Calculate the angle GFH.



6. VABCD is a pyramid with rectangular base ABCD.



Express CV in component form.

- 7. The diagram shows two vectors \mathbf{p} and \mathbf{q} , with $|\mathbf{p}| = 2$ and $|\mathbf{q}| = 3$. The angle between the vectors is 60° .
 - a) Evaluate
 - i) **p.p**
 - ii) **q.q**
 - iii) p.q
 - b) Another vector \mathbf{v} is defined by $\mathbf{v} = 3\mathbf{p} + 2\mathbf{q}$. Evaluate $\mathbf{v} \cdot \mathbf{v}$ and hence write down $|\mathbf{v}|$.

Revision

8. The line with equation y = 5x + k, where k is a constant, is a tangent to the curve with equation $y = 2x^2 + x - 5$.

Calculate the value of k and hence find the point of contact.