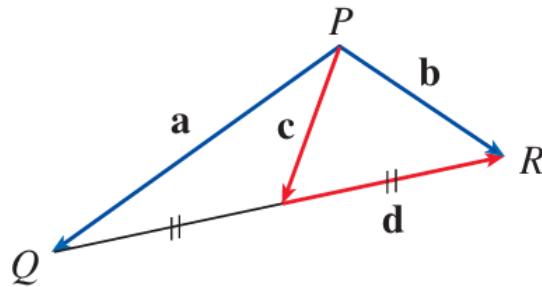


1. Find the lengths of the sides of the triangle  $PQR$ . Is it a right triangle? Is it an isosceles triangle?
  - (a)  $P(3, -2, -3), Q(7, 0, 1), R(1, 2, 1)$
  - (b)  $P(2, -1, 0), Q(4, 1, 1), R(4, -5, 4)$
2. In the figure, the tip of  $\mathbf{c}$  and the tail of  $\mathbf{d}$  are both the midpoint of  $QR$ . Express  $\mathbf{c}$  and  $\mathbf{d}$  in terms of  $\mathbf{a}$  and  $\mathbf{b}$



3. Find the directino cosines and direction angles of the vector. (keep anti-trigonometric function in results)
  - (a)  $\langle 4, 1, 8 \rangle$
  - (b)  $3\mathbf{i} - \mathbf{j} - 2\mathbf{k}$
  - (c)  $\langle c, c, c \rangle$ , where  $c > 0$