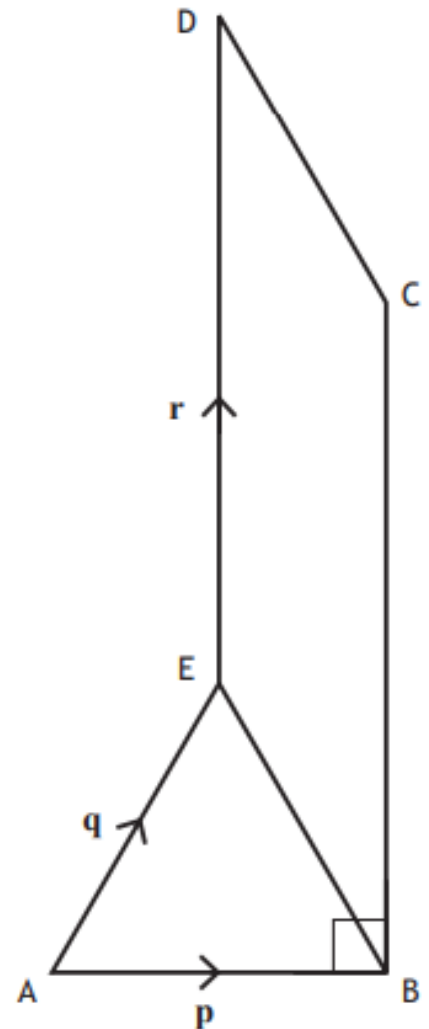




2015 P2 Q6

6. Vectors \mathbf{p} , \mathbf{q} and \mathbf{r} are represented on the diagram as shown.

- BCDE is a parallelogram
- ABE is an equilateral triangle
- $|\mathbf{p}| = 3$
- Angle $ABC = 90^\circ$



- (a) Evaluate $\mathbf{p} \cdot (\mathbf{q} + \mathbf{r})$.
- (b) Express \vec{EC} in terms of \mathbf{p} , \mathbf{q} and \mathbf{r} .
- (c) Given that $\vec{AE} \cdot \vec{EC} = 9\sqrt{3} - \frac{9}{2}$, find $|\mathbf{r}|$.

Answers

(a) 4.5 (b) $-\mathbf{q} + \mathbf{p} + \mathbf{r}$ (c) $\frac{3\sqrt{3}}{\cos 30}$