

Partial solutions for 2 4 5 7 10 17 23 25 33 39

2. 7

4. -1

5. 19

7. 1

10. $-2000\sqrt{2}$

17. Angle between \mathbf{a} and \mathbf{b} is $\cos^{-1}(-5/6) \approx 146^\circ$

23. .

(a) Orthogonal

(b) Not Orthogonal, Not parallel

(c) Not Orthogonal. Parallel

(d) Orthogonal

25. $\vec{QP} \cdot \vec{QR} = 0$. Orthogonal so right angle.

33. Direction angles are $\alpha \approx 48^\circ$, $\beta \approx 71^\circ$, and $\gamma \approx 107^\circ$

39. $|a| = 13$. Scalar projection of \mathbf{b} onto \mathbf{a} is $\text{comp}_a \mathbf{b} = 4$. Vector projection is $\text{proj}_a \mathbf{b} = \langle -\frac{20}{13}, \frac{48}{13} \rangle$