Answers ④

⑨ Parametric equations for the helix are

$x = \sin t$

$y = \cos t$

$z = t$

substituting into equation of sphere

$\sin^2 t + \cos^2 t + t^2 = 10 \Rightarrow 1 + t^2 = 10 \Rightarrow t = \pm 3$

$r(3) = (\sin(3), \cos(3), 3) \approx (0.141, -0.990, 3)$

$r(-3) = (\sin(-3), \cos(-3), -3) \approx (-0.141, -0.990, -3)$

} points of intersection

⑩ $\vec{PQ} = \langle 2, 3, 0 \rangle$

$\vec{PR} = \langle 2, 0, 1 \rangle$

$\vec{PQ} \times \vec{PR} = \langle 3, -2, -6 \rangle$