

Multiple Choice: (5 points each)

- Find the equation of the sphere which passes through the points $(2, 1, 3)$ and $(4, 5, -1)$.
 - $(x - 3)^2 + (y - 3)^2 + (z - 1)^2 = 3$
 - $(x - 3)^2 + (y - 3)^2 + (z - 1)^2 = 9$
 - $(x + 3)^2 + (y + 3)^2 + (z + 1)^2 = 9$
 - $(x - 3)^2 + (y - 3)^2 + (z - 1)^2 = 36$
 - $(x + 3)^2 + (y + 3)^2 + (z + 1)^2 = 36$
- The angle between the vectors $\vec{u} = (2, -2, 4)$ and $\vec{v} = (-1, 2, 1)$ is
 - acute
 - right
 - obtuse
 - none of these
- A wagon is pulled horizontally from the origin $(0, 0)$ to the point $(5, 0)$ meters by the force $\vec{F} = (4, 3)$ Newtons. Find the work done.
 - 20 Joules
 - 15 Joules
 - 25 Joules
 - $5\sqrt{5}$ Joules
 - $\sqrt{5}$ Joules
- A triangle has vertices $P = (-1, 2, -3)$, $Q = (3, 2, 1)$, and $R = (-1, -1, 0)$. Find the angle at P .
 - 30°
 - 45°
 - 60°
 - 90°
 - 120°
- A triangle has vertices $P = (-1, 2, -3)$, $Q = (3, 2, 1)$, and $R = (-1, -1, 0)$. Find the projection of the side \overrightarrow{PQ} onto the base \overrightarrow{PR} .
 - $\text{proj}_{\overrightarrow{PR}} \overrightarrow{PQ} = \left(\frac{3}{2}, 0, \frac{3}{2}\right)$
 - $\text{proj}_{\overrightarrow{PR}} \overrightarrow{PQ} = (-1, -1, 0)$
 - $\text{proj}_{\overrightarrow{PR}} \overrightarrow{PQ} = \left(-\frac{2}{3}, -\frac{2}{3}, 0\right)$
 - $\text{proj}_{\overrightarrow{PR}} \overrightarrow{PQ} = (0, -3, 3)$
 - $\text{proj}_{\overrightarrow{PR}} \overrightarrow{PQ} = (0, -2, 2)$