Trigonometry in Human Biology

Trigonometry · Practice Test · 8 Questions

1. In biomechanics, the angle formed by the long axis of the femur and the vertical axis of the tibia at the knee joint is known as what?

A) The Q-angle
B) The Pelvic tilt
C) The Sacral slope
D) The Carrying angle

2. When calculating the force exerted by a muscle during contraction, the component of force acting perpendicular to the bone is derived using which trigonometric function of the angle of pull?

A) Cosine
B) Sine
C) Tangent
D) Secant

3. The 'carrying angle' of the human elbow, which describes the angle between the humerus and the ulna when the arm is extended, is typically measured using what?

A) A goniometer
B) A stethoscope
C) A spirometer
D) An oximeter

4. In optometry, the refractive power of the human eye is often calculated using Snell's Law, which relies on the sine of which specific angles?

A) Incidence and refraction
B) Reflection and diffraction
C) Elevation and depression
D) Convergence and divergence

5. The center of mass of the human body in a standing position is typically located at a specific point relative to the sacrum, a calculation that requires finding the hypotenuse of a triangle formed by body segments in which coordinate system?

A) Polar
B) Cartesian
C) Spherical
D) Cylindrical

6. During a physical examination of the shoulder, the range of motion (abduction) is measured as an angular displacement, which is defined by the rotation of the humerus around which axis?

A) Sagittal
B) Frontal
C) Transverse
D) Longitudinal

7. The relationship between the length of the femur and the total leg length in gait analysis often involves using the tangent function to determine which specific biomechanical metric?

A) Stride angle
B) Hip flexion angle
C) Ankle plantarflexion
D) Tibial torsion

8. To determine the height of a human subject using the length of the humerus bone found in forensic anthropology, researchers often use regression formulas that utilize trigonometric ratios of the bone's epiphyses. What does the ratio represent?

A) Linear proportionality
B) Angular velocity
C) Centripetal force
D) Elastic modulus