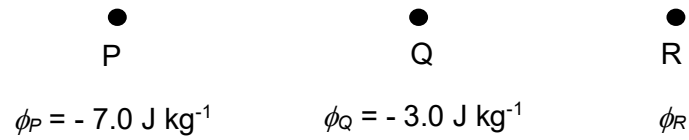12 Two points in space, P and Q, have gravitational potentials of -7.0 J kg⁻¹ and -3.0 J kg⁻¹ respectively as shown below.

$$\bullet \qquad\qquad \bullet \qquad\qquad \bullet$$

P   Q   R

$\phi_P = -7.0 \text{ J kg}^{-1}$ $\phi_Q = -3.0 \text{ J kg}^{-1}$ ϕ_R

When a mass is moved from P to Q, it gains gravitational potential energy of 20 J.

When it is moved from Q to R, it loses gravitational potential energy of 5.0 J.

What is the gravitational potential at R?

A - 8.0 J kg⁻¹   **B** - 4.0 J kg⁻¹   **C** - 2.0 J kg⁻¹   **D** 2.0 J kg⁻¹