your name(s) KEY

Physics 321 Quiz #11 - Friday, April. 12 2019

Work in groups of 3 or less.

1. (5 pts) Consider a mass m that moves according to the following potential,

$$V(x,y,z) = \frac{V_0}{\sqrt{x^2+y^2+a^2}}$$

Which of the following quantities are conserved? (Momentum is $\vec{p}$, angular momentum is $\vec{L}$ and the energy is E)
Circle the conserved quantities.

(a) p_x
(b) p_y
(c) p_z
(d) L_x
(e) L_y
(f) L_z
(g) E
(h) $|\vec{p}|$
(i) $|\vec{L}|$

2. (5 pts) Consider a mass m that moves according to the following potential,

$$V(x,y,z) = \frac{V_0}{|x|+a}$$

Which of the following quantities are conserved? (Momentum is $\vec{p}$, angular momentum is $\vec{L}$ and the energy is E)
Circle the conserved quantities.

(a) p_x
(b) p_y
(c) p_z
(d) L_x
(e) L_y
(f) L_z
(g) E
(h) $|\vec{p}|$
(i) $|\vec{L}|$

3. (5 pts) Consider a mass m that moves according to the following potential,

$$V(x,y,z) = \frac{k}{2}(x+y)^2.$$

Name as many independently conserved quantities as you can.

$p_x - p_y$, $L_x + L_y$, E, p_z