Practice worksheet | Rates of change and differential equations

Interpreting motion equations and simple harmonic motion

Name: _____ Date: _____

6 questions | 12 marks

1. For $x = 4\cos(2t)$ m, find velocity and acceleration. [2 marks]

2. Solve $x'' = -9x$, $x(0) = 0$, $v(0) = 6$. [2 marks]

3. Find amplitude and period of $x = 3\cos t + 4\sin t$. [2 marks]

4. For $x = 5\cos 2t$, find the first positive time at equilibrium. [2 marks]

5. A particle has $a(t) = 2t$, $v(0) = 1$, $x(0) = 4$. Find its position. [2 marks]

6. A model has $x'' = -16(x - 2)$. State its equilibrium and period. [2 marks]