0.1 Homework 01 - Forces + Newton's Laws

9.

$$x''(0.7) = -16.8$$
$$y''(0.7) = -18$$

a)

$$a = \sqrt{16.8^2 + 18^2} = 24.62$$
$$ma = (0.340)(24.62) = \boxed{8.37N}$$

b) $-133.025°$

c)

$$\arctan\left(\frac{v_y}{v_x}\right)\Big|_{t=0.7} = \boxed{-124.716°}$$

13.

$$\begin{bmatrix} 0.9 & -9.8 \\ 49 - 9.8 & -9.8 \\ 58.8 - 49 & -9.8 \\ 98 - 58.8 & -9.8 \end{bmatrix} X = \begin{bmatrix} 0 \\ 0 \\ 0 \\ 0 \end{bmatrix}$$

$$X = \begin{bmatrix} 1 \\ 4 \\ 1 \\ 4 \end{bmatrix}$$

Therefore, $A = 4kg, B = 1kg, C = 4kg, D = 1kg$

17.

26.

27.

41.

44.

54.