MacKay M.

1) $3y + 10x = 7$ $\rightarrow$ $y = \dfrac{3y = 10x + 7}{3}$ $\rightarrow$ $y = -2x + \dfrac{7}{3}$
   $(4, -5)$

$S: -2 \rightarrow y - (-5) = -2(x - (4)) \rightarrow y + 5 = -2(x - 4)$

2) $f(x) = \frac{1}{2}x^2 - 5x$ $\rightarrow$ $f(a) = f(4) = \frac{1}{2}(4)^2 - 5(4)$
  $f'(x) = x - 5$ $\frac{1}{2} \cdot 16 - 20$
     $x = 4$ $8 - 20 = \boxed{-12}$

$y - f(a) = f'(a)(x - a)$ $f'(a) = (4) - 5 = \boxed{1}$

$\boxed{\text{Tangent Line} = y - 12 = 1(x + 4)}$

3) $f(x) = \begin{cases} \frac{1}{4}x + 4 & \text{if } x \leq 4 \rightarrow (\text{left or equal}) \\ 3x + k & \text{if } x > 4 \rightarrow (\text{right}) \end{cases}$
  $x \rightarrow 4$

$f(4) = 3(4) + 4 = 16$

$\lim\limits_{x \to 4^-} f(x) = \lim\limits_{x \to 4^-} \left(\frac{1}{4}(4) + 4\right) = 5 \longrightarrow$

$\lim\limits_{x \to 4^+} f(x) = \lim\limits_{x \to 4^+} (3(4) + 4) = 16$

4) $P(x) = -x^2 + 10x - (3x + 6)$ $\longrightarrow$ b) at $0 they would make
  $P(x) = -x^2 + 7x - 6$ $\underline{1000}$ to $\underline{6000}$ units

a) $0 = -(x^2 - 7x + 6)$

      $(x - 6)(x - 1)$
       $x = 6$ $x = 1$

$$x < 2 = (\text{Left})$$
$$x \geq 2 = (\text{right})$$

5) $f(x) = \lim\limits_{x \to -4} = \dfrac{2(4)^2 + 3(-4) + 20}{(-4)^2 (-4) - 20} = \dfrac{0}{0}$ DNE

o $f(x) \lim\limits_{x \to 4^+} = 2(-4)^2 + 3 = 35$

6) $C(x) = 900 - 30x^2 \qquad f(x+h) = 30(30x^2)$
   $(x = 4 \qquad\qquad\qquad \downarrow$
   $\qquad\qquad\qquad\qquad x+h$