3-0235 — 50 SHEETS — 5 SQUARES
3-0236 — 100 SHEETS — 5 SQUARES
3-0237 — 200 SHEETS — 5 SQUARES
3-0137 — 200 SHEETS — FILLER
COMET

1) a. $P = (15, 250)$

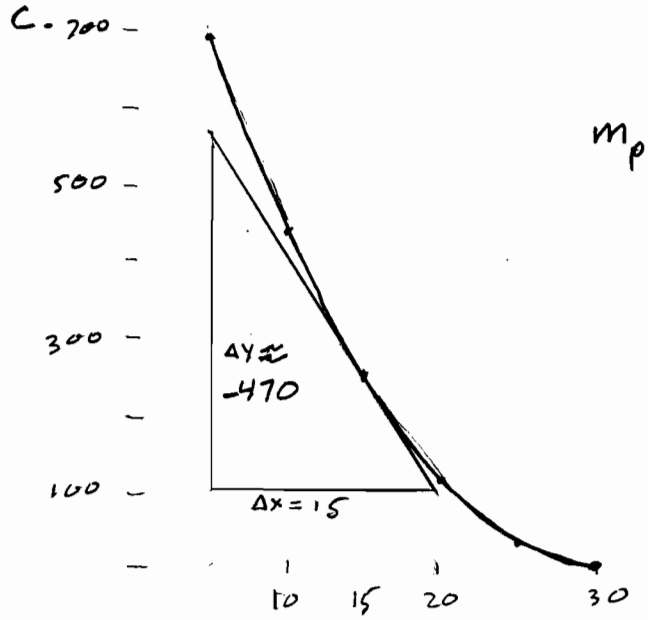
Q	m_{PQ}
5, 694	-44.4
10, 444	-38.8
20, 111	-27.8
25, 28	-22.2
30, 0	$-16.6\overline{6}$

$\frac{250 - 694}{15-5} = 44.4$

$\frac{250 - 440}{15-10} =$

b. $m_p \approx \frac{1}{2}(-38.8 + -27.8)$

$\approx 33.3\overline{3}$



$m_p \approx \frac{-470}{15}$

$\approx 31.3\overline{3}$ ← hand drawn curve

3-0235 — 50 SHEETS — 5 SQUARES
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3-0237 — 200 SHEETS — 5 SQUARES
3-0137 — 200 SHEETS — FILLER
COMET

3) a. $f(x) = \frac{x}{1+x}$

$P = (1, 1/2)$ $Q = \left(x, \frac{x}{1+x}\right)$

$$m_{PQ} = \left(\frac{\frac{x}{1+x} - \frac{1}{2}}{x-1}\right)$$

x	m_{PQ}
.5	.333333
.9	.263158
.99	.251256
.999	.250125
1.5	.2
1.1	.238095
1.01	.248756
1.001	.249875

b. estimate for m_p is .25

c. Equation: $y - P_y = m_p(x - P_x)$

$y - 1/2 = .25(x-1)$

$y = .25x + .25$

5) $y = 40t - 16t^2 = f(t)$

Starting at $t=2$, find avg velocity between time t and $t + \Delta t$, for $\Delta t = .5, .1, .05, .001$

Δt	Avg Vel
.5	-32 ft/sec
.1	-25.6 ft/sec
.05	-24.8 ft/sec
.001	-24.016 ft/sec

$$\text{avg vel} = \frac{f(t+\Delta t) - f(t)}{\Delta t}$$

b. $v \approx -24$ ft/sec

3-0235 — 50 SHEETS — 5 SQUARES
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3-0237 — 200 SHEETS — 5 SQUARES
3-0137 — 200 SHEETS — FILLER
COMET

6) $h(t) = 10t - 1.86t^2$

a. Find Avg velocity over given interval $[t_1, t_2]$

$$\text{Avg vel} = \frac{h(t_2) - h(t_1)}{t_2 - t_1}$$

$$= \frac{h(t_1 + \Delta t) - h(t_1)}{\Delta t} \quad \text{where } \Delta t = t_2 - t_1$$

int	Avg vel
1, 2	4.42 m/s
1, 1.5	5.35 m/s
1, 1.1	6.094 m/s
1, 1.01	6.2614
1, 1.001	6.27814

b. estimated velocity at $t = 1$ is 6.28 m/s

7) a.

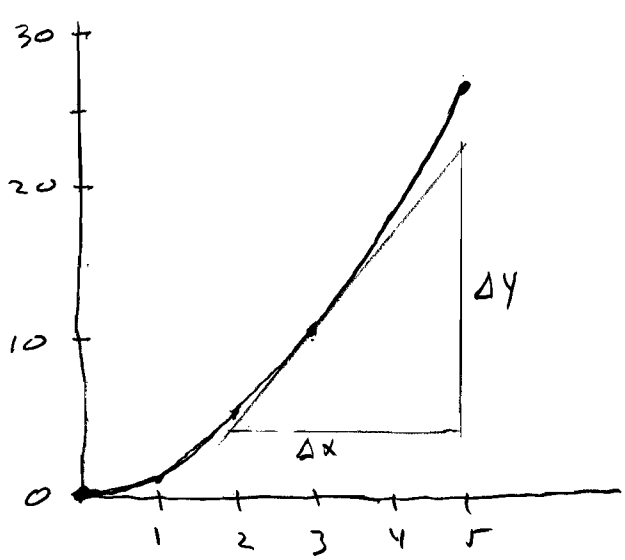
Time Period	Avg Vel
1, 3	4.65 m/s
2, 3	5.6 m/s
3, 5	7.55 m/s
3, 4	7.0 m/s

$$\text{Avg Vel} = \frac{s(t_2) - s(t_1)}{t_2 - t_1}$$

$$\frac{s(3) - s(1)}{3-1} = \frac{10.7 - 1.4}{2} = 4.65$$

$$\frac{s(3) - s(2)}{3-2} = \frac{10.7 - 5.1}{1} = 5.6$$

b.



$\Delta x = 5 - 2 = 3$

$\Delta y = 22.5 - 4 = 18.5$

$m = \frac{18.5}{3} \approx 6.17$