(2). a. $m = \frac{2948-2530}{42-36} \approx 69.67$.

b. $m = \frac{2948-2661}{42-38} = 71.75$.

c. $m = \frac{2948-2806}{42-40} = 71$.

d. $m = \frac{3080-2948}{44-42} = 66$.

From the data, we see that the patient's heart rate is decreasing from 71 to 66 heartbeats/minute after 42 minutes. After being stable for a while, the patient's heart rate is dropping.

(3). a.

	x	Q	m_{PQ}
(i)	0.5	(0.5, 0.333333)	0.333333
(ii)	0.9	(0.9, 0.473684)	0.263158
(iii)	0.99	(0.99, 0.497487)	0.251256
(iv)	0.999	(0.999, 0.499750)	0.250125
(v)	1.5	(1.5, 0.6)	0.2
(vi)	1.1	(1.1, 0.523810)	0.238095
(vii)	1.01	(1.01, 0.502488)	0.248756
(viii)	1.001	(1.001, 0.500250)	0.249875

b. The slope appears to be $\frac{1}{4}$.

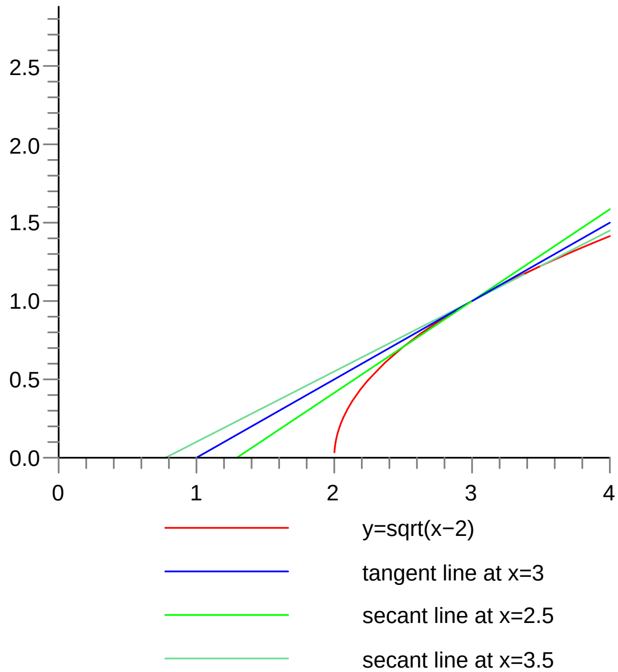
c. $y - \frac{1}{2} = \frac{1}{4}(x-1)$.

(4). a.

	x	Q	m_{PQ}
(i)	2.5	(2.5, 0.707107)	0.585786
(ii)	2.9	(2.9, 0.948683)	0.513167
(iii)	2.99	(2.99, 0.994987)	0.501256
(iv)	2.999	(2.999, 0.999500)	0.500125
(v)	3.5	(3.5, 1.224745)	0.449490
(vi)	3.1	(3.1, 1.048809)	0.488088
(vii)	3.01	(3.01, 1.004988)	0.498756
(viii)	3.001	(3.001, 1.000500)	0.499875

b. The slope appears to be $\frac{1}{2}$.

c. $y - 1 = \frac{1}{2}(x-3)$.



d.

(5). a. $y = y(t) = 10t - 4.9t^2$. At $t = 1.5$, $y(1.5) = 10(1.5) - 4.9(1.5)^2 = 3.975$. The average velocity between times 1.5 and $1.5 + h$ is
$v_{\text{ave}} = \frac{y(1.5+h)-y(1.5)}{(1.5+h)-1.5} = \frac{[10(1.5+h)-4.9(1.5+h)^2]-3.975}{h} = -4.7h - 4.9h^2$, if $h \neq 0$.

(i). $[1.5, 2]$, $h = 0.5$, $v_{\text{ave}} = -7.15$ m/s.

(ii). $[1.5, 1.6]$, $h = 0.1$, $v_{\text{ave}} = -5.19$ m/s.

(iii). $[1.5, 1.55]$, $h = 0.05$, $v_{\text{ave}} = -4.945$ m/s.

(iv). $[1.5, 1.51]$, $h = 0.01$, $v_{\text{ave}} = -4.749$ m/s.

b. The instantaneous velocity when $t = 1.5$ (h approaches 0) is -4.7 m/s.