§5.1

4 or 6 $\left(-\frac{5}{7}, \frac{2\sqrt{6}}{7}\right)$

$\left(-\frac{5}{7}\right)^2 + \left(\frac{2\sqrt{6}}{7}\right)^2 = \frac{25}{49} + \frac{24}{49} = \frac{49}{49} = 1$ ∴ unit circle

7 or 9 $\left(-\frac{3}{5}, ?\right)$; QIII → ∴ $y = -$

$\left(-\frac{3}{5}\right)^2 + y^2 = 1^2 \Rightarrow y^2 = \frac{25}{25} - \frac{9}{25} = \frac{16}{25} \Rightarrow y = \pm\sqrt{\frac{16}{25}} = \pm\frac{4}{5}$

$y = -\frac{4}{5}$

11 or 13 $\left(?, -\frac{2}{7}\right)$; QIV ∴ $x = +$

$x^2 + \left(-\frac{2}{7}\right)^2 = 1^2 \Rightarrow x^2 = \frac{49}{49} - \frac{4}{49} = \frac{45}{49} \Rightarrow x = \pm\sqrt{\frac{45}{49}}$ (5·3²)

$x = \pm\frac{3\sqrt{5}}{7} \Rightarrow x = 3\sqrt{5}/7$

Note: Solutions manual says $x^2 = 1 - 4/49 = 5$, so $x = \sqrt{5}$! I don't think so!! ☺ See, we all make errors, even people who have "checkers"

16 or 18 The x-coord is "+" and y-coord is $\sqrt{5}/5$ ∴ in QIV

$x^2 + \frac{5}{25} = 1 \Rightarrow x^2 = \frac{25}{25} - \frac{5}{25} = \frac{20}{25} \Rightarrow x = \pm\sqrt{\frac{20}{25}}$ (2·5)

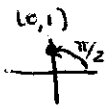
$x = \pm\frac{2\sqrt{5}}{5} \rightarrow x = 2\sqrt{5}/5$

17 or 19 The x-coord is $-\sqrt{2}/3$ and P lies below x-axis ∴ y is "−" ∴ QIII

$\left(-\sqrt{2}/3\right)^2 + y^2 = 1^2 \Rightarrow y^2 = \frac{9}{9} - \frac{2}{9} = \frac{7}{9} \Rightarrow y = \pm\frac{\sqrt{7}}{3}$

∴ $y = -\sqrt{7}/3$

21 or 23 On unit circle & $t = \pi/2$



$(0,1)$

23 or 25 $t = 5\pi/6$ so $\bar{t} = 6\pi/6 - 5\pi/6 = \pi/6$ in QII

$\pi/6 \Rightarrow (\sqrt{3}/2, 1/2)$ ∴ in QII x is − & y is +

so $\left(-\sqrt{3}/2, 1/2\right)$

25 or 27 $t = -\pi/3$ so $\bar{t} = 0 - (-\pi/3) = \pi/3$ in QIV

$\pi/3 \Rightarrow (1/2, \sqrt{3}/2)$ ∴ in QIV x is + & y is −

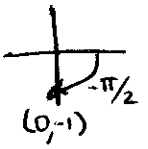
So $\left(1/2, -\sqrt{3}/2\right)$

27 or 29 $t = 2\pi/3$ so $\bar{t} = \frac{3\pi}{3} - \frac{2\pi}{3} = \frac{\pi}{3}$ in QII

$\pi/3$ is $(1/2, \sqrt{3}/2)$ ∴ in QII x is − & y is +

so $\left(-1/2, \sqrt{3}/2\right)$

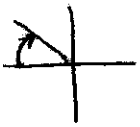
28 or 30 $t = -\pi/2$ so $\bar{t} = 0 - (-\pi/2) = \pi/2$ between QIII & QIV



$(0,-1)$

31 or 33 $P(x,y)$ is $\left(\frac{3}{5}, \frac{4}{5}\right)$ QI point determine $P(x,y)$

ⓐ $\pi - t$ (t is in QII, $P(-x,y)$)



$(-3/5, 4/5)$

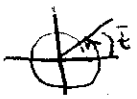
ⓑ $-t$ (t is in QIV, $P(x,-y)$)

$(3/5, -4/5)$

ⓒ $\pi + t$ (t is in QIII, $P(-x,-y)$)

$(-3/5, -4/5)$

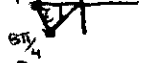
ⓓ $2\pi + t$ (t is in QI again)



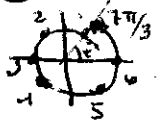
$(3/5, 4/5)$

33 or 35 Find $\bar{t}$ for each

ⓐ $t = 5\pi/4 \Rightarrow \bar{t} = \frac{5\pi}{4} - \frac{4\pi}{4} = \frac{\pi}{4}$ in QIII



ⓑ $t = 7\pi/3 \Rightarrow \bar{t} = \frac{7\pi}{3} - \frac{6\pi}{3} = \frac{\pi}{3}$ in QI



ⓒ $t = -4\pi/3 \Rightarrow \bar{t} = \frac{4\pi}{3} - \frac{3\pi}{3} = \frac{\pi}{3}$ in QII

ⓓ $t = \pi/6$ $\bar{t} = \pi/6$ in QI

§5.1 cont'd p.2

(35 or 37) Find $\bar{t}$ for each

(a) $t = 5\pi/7$ $\quad \boxed{\bar{t} = \frac{7\pi}{7} - \frac{5\pi}{7} = \frac{2\pi}{7}}$ in QII

(b) $t = -7\pi/9$ $\quad \boxed{\bar{t} = \frac{9\pi}{9} - \frac{7\pi}{9} = \frac{2\pi}{7}}$ in QIII

(c) $t = -3$ $\quad \boxed{\bar{t} = \pi - 3 \approx 0.142}$ in QIII

(d) $t = 5$ $\quad \boxed{\bar{t} = 5 - \pi \approx 1.283}$ in QIII

(37 or 39) $t = \frac{2\pi}{3} \Rightarrow \boxed{\bar{t} = \frac{3\pi}{3} - \frac{2\pi}{3} = \frac{\pi}{3}}$ in QII

$\frac{\pi}{3} \Rightarrow \left(\frac{1}{2}, \sqrt{3}/2\right)$ so in QII where $(-x, y)$

$\boxed{\left(-\frac{1}{2}, \sqrt{3}/2\right)}$