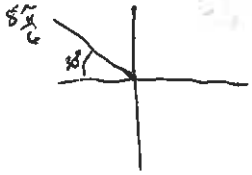
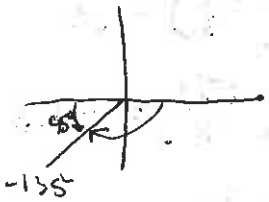
Pre-calc worksheet 3.

① $\cos\left(\frac{5\pi}{6}\right) = -\frac{\sqrt{3}}{2}$

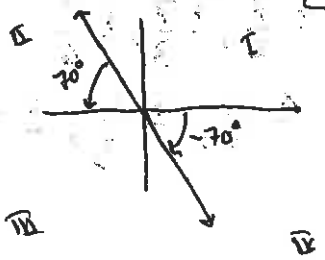


② $\sin(-135) = -\frac{\sqrt{2}}{2}$



③ $\tan\theta = -2.7475$

$\theta = -70°$ $\quad \theta = 110°, 290°$



④ $a = 4$

$p = \frac{2\pi}{2} = \pi$

$S\uparrow = 3$

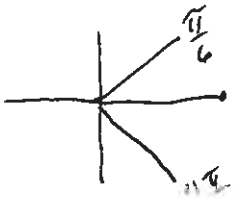
$S\leftarrow = \frac{\pi}{2}$

⑤ $2\cos x - \sqrt{3} = 0$

$2\cos x = \sqrt{3}$

$\cos x = \frac{\sqrt{3}}{2}$

$x = \frac{\pi}{6}, \frac{11\pi}{6}$



⑥ $2\sin^2 x - 5\sin x + 3 = 0$

$(2\sin x - 3)(\sin x - 1) = 0$

$2\sin x - 3 = 0 \quad \sin x - 1 = 0$

$\sin x = \frac{3}{2} \quad \sin x = 1$

$x = 90°$

$\emptyset$

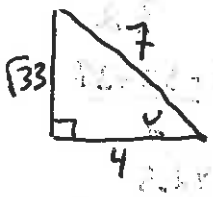
⑦ $\cos u = -\frac{4}{7}$, $\tan u > 0 \Rightarrow$ QIII

$\cos(2u) = 2\left(-\frac{4}{7}\right)^2 - 1 = \frac{-17}{49}$

$\sin 2u = 2\sin(u)\cos(u)$

$= 2\left(\frac{-\sqrt{33}}{7}\right)\left(-\frac{4}{7}\right)$

$= \frac{8\sqrt{33}}{49}$



⑧ $\sin(330+45)$

$= \sin(330)\cos(45) + \sin(45)\cos(330)$

$= \left(-\frac{1}{2}\right)\left(\frac{\sqrt{2}}{2}\right) + \left(\frac{\sqrt{2}}{2}\right)\left(\frac{\sqrt{3}}{2}\right)$

$= -\frac{\sqrt{2}}{4} + \frac{\sqrt{6}}{4}$

$= \frac{-\sqrt{2}+\sqrt{6}}{4}$

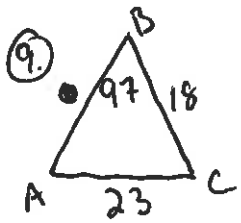
$\cos(330+45)$

$= \cos(330)\cos(45) + \sin(330)\sin(45)$

$= \left(\frac{\sqrt{3}}{2}\right)\left(\frac{\sqrt{2}}{2}\right) + \left(-\frac{1}{2}\right)\left(\frac{\sqrt{2}}{2}\right)$

$= \frac{\sqrt{6}-\sqrt{2}}{4}$

⑨

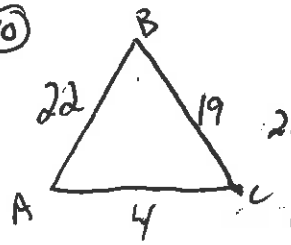


$\frac{\sin(97)}{23} = \frac{\sin(A)}{18}$

$\sin(A) = \frac{18\sin(97)}{23}$

$A \approx 51°$

$\angle C = 180 - 97 - 51 = 32°$

(10) 

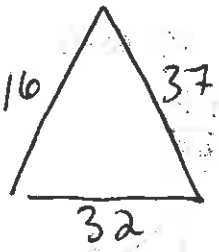
$c^2 = a^2 + b^2 - 2ab\cos C$

$22^2 = 19^2 + 4^2 - 2(19)(4)\cos(C)$

$\cos C = \frac{19^2 + 4^2 - 22^2}{2(19)(4)}$

$\cos C = \frac{-107}{152}$

$C \approx 134.7°$

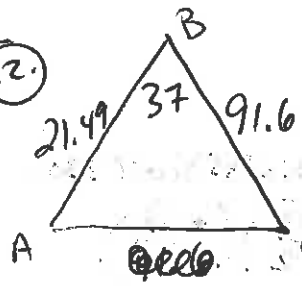
(11) 

$s = \frac{16+32+37}{2} = 42.5$

$K = \sqrt{s(s-16)(s-32)(s-37)}$

$= \sqrt{65040.9375}$

≈ 255 sq. units.

(12) 

$K = \frac{1}{2}ac\sin(B)$

$= \frac{1}{2}(91.6)(21.49)\sin(37)$

≈ 592.33 sq. units.

(13) $(-2, -\sqrt{3})$ ← QIII

$r = \sqrt{(-2)^2 + (-\sqrt{3})^2} = \sqrt{7}$

$\theta = \tan^{-1}\left(\frac{-\sqrt{3}}{-2}\right) \approx 41°$ ← QI

$(\sqrt{7}, 221°)$

(14) $(-\sqrt{6}, \sqrt{2})$ ← QII

$r = \sqrt{(-\sqrt{6})^2 + (\sqrt{2})^2} = \sqrt{8}$

$\theta = \tan^{-1}\left(\frac{\sqrt{2}}{-\sqrt{6}}\right) \approx -30°$ ← QIV

$(\sqrt{8}, 150°)$

(15) $(3, -\pi)$

$x = 3\cos(-\pi) = -3$

$y = 3\sin(-\pi) = 0$

$(-3, 0)$

(16) $(-4, \frac{2\pi}{3})$

$x = -4\cos(\frac{2\pi}{3}) = 2$

$y = -4\sin(\frac{2\pi}{3}) = -2\sqrt{3}$

$(2, -2\sqrt{3})$

(17) $f(x) = 6x^3 - 3x^2 + x + 7$

$= \pm\frac{7,1}{6,3,2,1} = \pm\frac{7}{1}, \pm\frac{7}{2}, \pm\frac{7}{3}, \pm\frac{7}{6}$

$\pm\frac{1}{1}, \pm\frac{1}{2}, \pm\frac{1}{3}, \pm\frac{1}{6}$

(18) $a_4 = 15 \quad a_9 = 65$

n	a_n
4	15
9	65

$d = \frac{65-15}{9-4} = \frac{50}{5} = 10$

$a_n = 15 + 10(n-4)$

$= 15 + 10n - 40$

$= 10n - 25$