§6.7 Questions? #87, 111

$$(x^2+y^2)^2 = x^2-y^2$$

$$(r^2)^2 = r^2\cos^2\theta - r^2\sin^2\theta = r^2(\cos^2\theta \quad \sin^2\theta)$$

$r^2 = \cos^2\theta - \sin^2\theta$ is pretty good.

$r^2 = \cos(2\theta)$ is easier to graph

111 $\quad r = \dfrac{2}{1+\sin\theta}$

$$\sqrt{x^2+y^2} = \frac{2}{1+\frac{y}{r}} = \frac{2}{\frac{r+y}{r}} = \frac{2r}{y+r}$$

$$\cancel{\left(\sqrt{x^2+y^2}\right)}\left(y+\sqrt{x^2+y^2}\right) = 2\cancel{\sqrt{x^2+y^2}}$$

$$y+\sqrt{x^2+y^2} = 2$$

$$\sqrt{x^2+y^2} = 2-y$$

$$x^2+y^2 = y^2-2y+1$$

$$x^2 = -2y+1$$

$x^2+2y-1=0$ Book ans

$$2y = 1-x^2$$

$$y = \tfrac{1}{2}-\tfrac{1}{2}x^2$$

§6.8: Make note sheet on the techniques
Try a couple graphs. No pressure.

§4.3 #s 5-27, 35-39, 49, 51, 55, 57, 59, 61, 63, 65

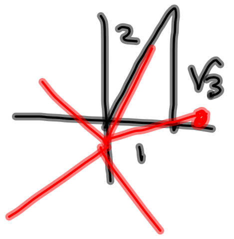
§4.4 #s 5-11, 21-33, 41, 43, 47, 53-61

$$z^n = r^n\left(\cos(n\theta) + i\sin(n\theta)\right)$$

$$z^{\frac{1}{n}} = r^{\frac{1}{n}}\left(\cos\left(\frac{\theta+2k\pi}{n}\right) + i\sin\left(\frac{\theta+2k\pi}{n}\right)\right)$$

$k = 0, 1, 2, \ldots, n-1$

$\sqrt[5]{1+\sqrt{3}}$ = Principal. Find all.



$$\sqrt[5]{2\left(\cos\frac{\pi}{3} + i\sin\frac{\pi}{3}\right)}$$

$$= \sqrt[5]{2}\left(\cos\frac{\frac{\pi}{3}+2k\pi}{5} + i\sin\left(\frac{\frac{\pi}{3}+2k\pi}{5}\right)\right)$$

$$\sqrt[5]{1+\sqrt{3}} = \sqrt[5]{2}\left(\cos\frac{\pi}{15} + i\sin\frac{\pi}{15}\right)$$

The other 4 are found by adding $\frac{2\pi}{5}$ to this and the next....

$(3x-2y)^5$

$$
\begin{array}{ccccccccccc}
 & & & & & 1 & & & & & \\
 & & & & 1 & & 1 & & & & \\
 & & & 1 & & 2 & & 1 & & & \\
 & & 1 & & 3 & & 3 & & 1 & & \\
 & 1 & & 4 & & 6 & & 4 & & 1 & \\
1 & & 5 & & 10 & & 10 & & 5 & & 1
\end{array}
$$

$= 1(3x)^5 + 5(3x)^4(-2y)^1$

$+ 10(3x)^3(-2y)^2 + 10(3x)^2(-2y)^3 + 5(3x)(-2y)^4$

$+ 1(-2y)^5$