

HOMEWORK 6

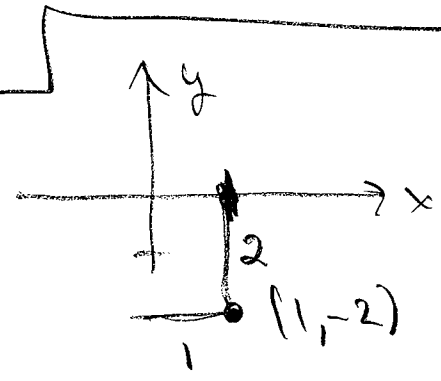
8.1: 26, 38, 56, 61a

8.2: 18, 48

8.1:26: (r, theta) = (6, 2pi/3),

x = r cos theta = 6 cos(2pi/3) = -3
y = r sin theta = 6 sin(2pi/3) = +3sqrt(3)

(x, y) = (-3, 3sqrt(3))



8.1:38: (x, y) = (1, -2),

r = sqrt(x^2 + y^2) = sqrt(1 + 4) = sqrt(5)

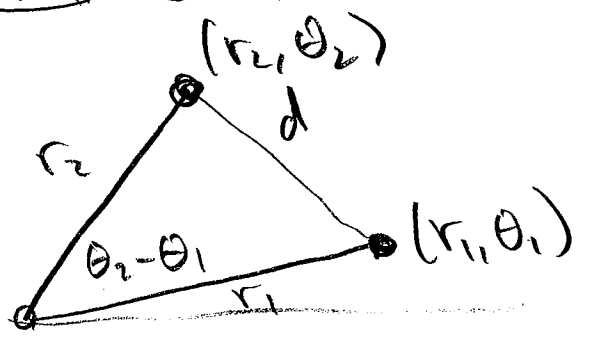
theta = tan^-1(y/x) = tan^-1(-2/1)

(r, theta) = (sqrt(5), tan^-1(-2))

8.1:56 r = 4 / (1 + sin theta) } convert to cartesian

=> r + r sin theta = 4 => sqrt(x^2 + y^2) + y = 4

6.1q GET POLAR DISTANCE FORMULA



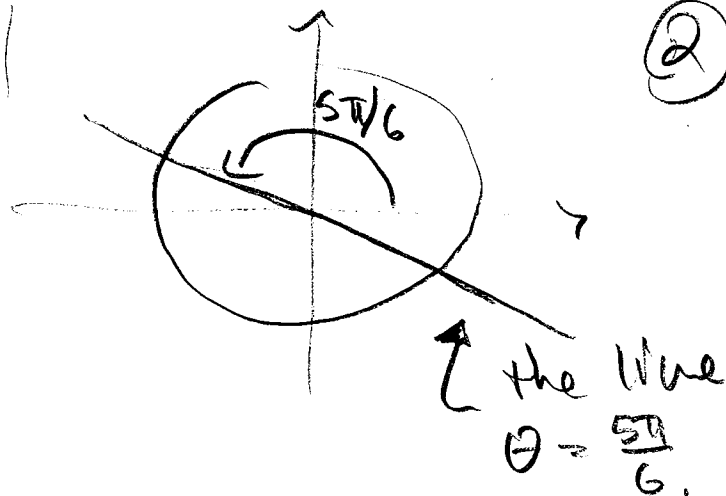
by law of cosines

d^2 = r1^2 + r2^2 - 2r1r2 cos(theta2 - theta1)

=> d = sqrt(r1^2 + r2^2 - 2r1r2 cos(theta2 - theta1))

8.2:18

graph  $\theta = 5\pi/6$



8.2:48

graph  $(x^2 + y^2)^3 = (x^2 - y^2)^2$ .

use  $x = r\cos\theta$  &  $y = r\sin\theta$ .

$$\Rightarrow (r^2)^3 = (r^2(\cos\theta)^2 - r^2(\sin\theta)^2)^2$$

$$\Rightarrow r^6 = r^4 ((\cos\theta)^2 - (\sin\theta)^2)^2$$

$$\Rightarrow r^2 = (\cos(2\theta))^2$$

$$\Rightarrow r = \cos(2\theta)$$

