

(Thomas's Calculus)

§11.3

$$\Phi(r, \theta) = (r \cos \theta, r \sin \theta)$$

16) a) $\Phi(\sqrt{2}, \frac{\pi}{4}) = (\sqrt{2} \cos \frac{\pi}{4}, \sqrt{2} \sin \frac{\pi}{4}) = (1, 1)$ //

b) $\Phi(1, 0) = (\cos 0, \sin 0) = (1, 0)$ //

c) $\Phi(0, \frac{\pi}{2}) = (0, 0)$ //

d) $\Phi(2\sqrt{3}, \frac{2\pi}{3}) = (2\sqrt{3} \cos \frac{2\pi}{3}, 2\sqrt{3} \sin \frac{2\pi}{3}) = (-\sqrt{3}, \sqrt{3})$ //

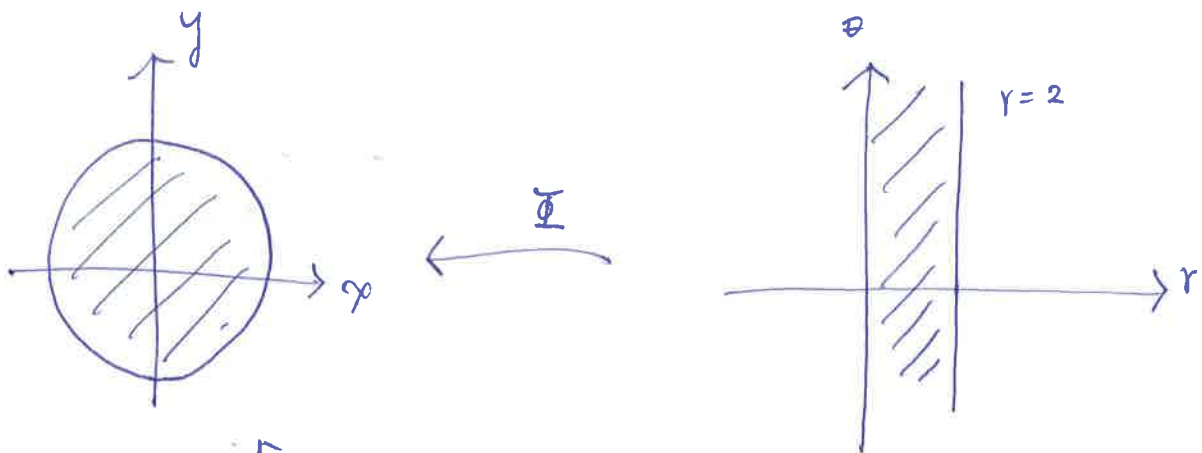
18) a) $\Phi^{-1}(-2, -2) = \left(\sqrt{(-2)^2 + (-2)^2}, \tan^{-1}\left(\frac{-2}{-2}\right) \right)$
 $= (2\sqrt{2}, \frac{-3\pi}{4})$ // OR $\frac{5\pi}{4}$ using the choice of domain in class

b) $\Phi^{-1}(-\sqrt{3}, 1) = \left(\sqrt{(-\sqrt{3})^2 + 1^2}, \tan^{-1}\left(\frac{1}{-\sqrt{3}}\right) \right)$
 $= (2, \frac{5\pi}{6})$ //

c) $\Phi^{-1}(-3, 0) = (3, \pi)$ //

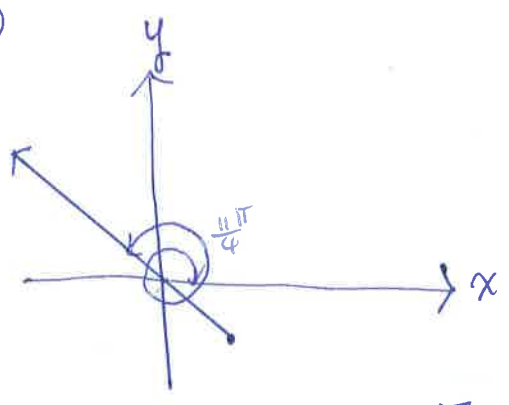
d) $\Phi^{-1}(5, -12) = \left(\sqrt{5^2 + 144}, \tan^{-1}\left(\frac{-12}{5}\right) \right) = (13, \tan^{-1}\left(\frac{-12}{5}\right))$ //

12)

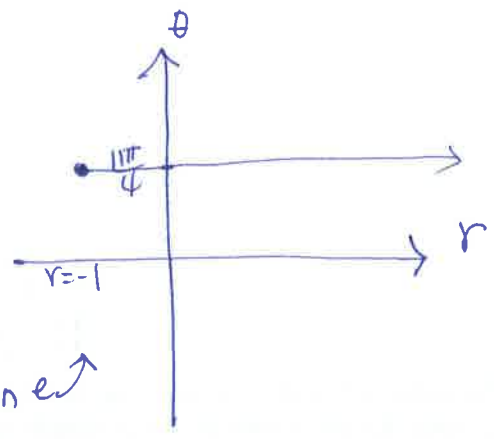


either one \nearrow OK.

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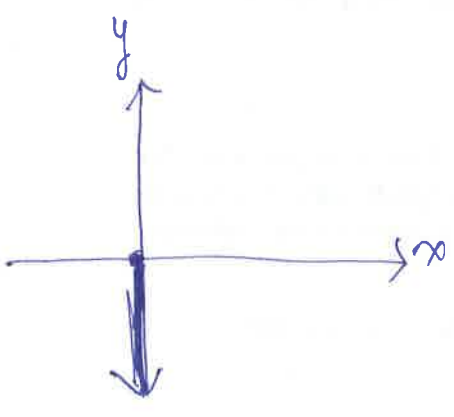


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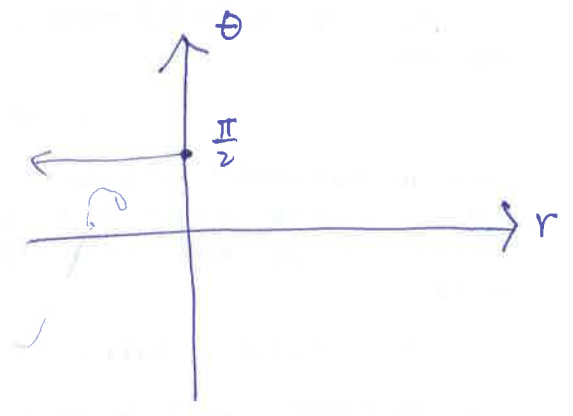


either one is OK

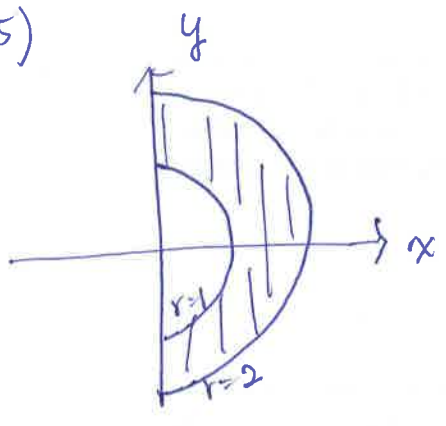
(20)



Φ



(25)



Φ

