MATH 232 NAME:
10.3

Partial solutions for 2 3 5 8 15 17 18 21 22 29 33 55 59 63 64

2. Examples: (a) $(2, 5\pi, 6)$, $(2, 17\pi/6)$, $(-2, -\pi/6)$

(b) $(1, -2\pi/3)$, $(1, 4\pi/3)$, $(-1, \pi/3)$

(c) $(-1, 5\pi/4)$, $(1, \pi/4)$, $(-1, -3\pi/4)$

3. (a) (0,-2)

(b) (1, 1)

(c) $\left(-\dfrac{\sqrt{3}}{2}, \dfrac{1}{2}\right)$

5. $(4\sqrt{2}, 3\pi/4)$ and $(-4\sqrt{2}, 7\pi/4)$

8. . Region inside the circle $r = 2$ from $\pi \leq \theta \leq 3\pi/2$

15. $x^2 + y^2 = 5$. Circle radius $\sqrt{5}$ centered at origin.

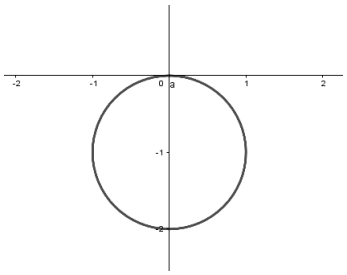
17. $(x - 5/2)^2 + y^2 = 25/4$. Circle radius $5/2$ centered at $(5/2, 0)$

18. $y = \sqrt{3}x$

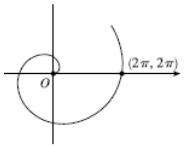
21. $r = 2\csc(\theta)$

22. $\theta = 5/4$ or $\theta = 5\pi/4$

29. .



33. .



55. $\dfrac{dy}{dx} = -\cot(2\theta)$. Trig identities involved.

59. $\dfrac{dy}{dx} = \dfrac{\cos(2\theta)\cos(\theta) + \sin(\theta)(-2\sin(2\theta))}{\cos(2\theta)(-\sin(\theta)) + \cos(\theta)(-2\sin(2\theta))}$ and $\dfrac{dy}{dx} = 1$ at $\theta = \pi/4$.

63. Horizontal tangents at $(3/2, \pi/3)$, $(0, \pi)$, $(3/2, 5\pi/3)$. Vertical tangents at $(2, 0)$, $(1/2, 2\pi/3)$, and $(1/2, 4\pi/3)$.

64. Infinitely many of both. Horizontal tangents occur when $\theta = -\pi/4 + n\pi$. Verticals occur when $\theta = \pi/4 + n\pi$.