MTH 162 Homework 13

Do the first five problems. Due: Apr 23, 2014 (Wednesday). Hand in to me during the class.

Compulsory:

Ex 9.3

13-16 ■ Identify the curve by finding a Cartesian equation for the curve.

13.
$$r = 2 \cos \theta$$

17-20 ■ Find a polar equation for the curve represented by the given Cartesian equation.

17.
$$y = 1 + 3x$$

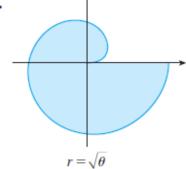
47–50 ■ Find the slope of the tangent line to the given polar curve at the point specified by the value of θ .

48.
$$r = 2 - \sin \theta$$
, $\theta = \pi/3$

Ex 9.4

5-8 ■ Find the area of the shaded region.

5.



33-36 ■ Find the exact length of the polar curve.

33.
$$r = 3 \sin \theta$$
, $0 \le \theta \le \pi/3$

(What's this curve geometrically?)

Recommended: (These types of questions may also appear in the exams)

Ex 9.3

13-16 • Identify the curve by finding a Cartesian equation for the curve.

13.
$$r = 2 \cos \theta$$

14.
$$\theta = \pi/3$$

15.
$$r^2 \cos 2\theta = 1$$

16.
$$r = \tan \theta \sec \theta$$

17-20 • Find a polar equation for the curve represented by the given Cartesian equation.

17.
$$y = 1 + 3x$$

18.
$$4y^2 = x$$

19.
$$x^2 + y^2 = 2cx$$

20.
$$xy = 4$$

47-50 ■ Find the slope of the tangent line to the given polar curve at the point specified by the value of θ .

47.
$$r=2\sin\theta$$
, $\theta=\pi/2$

47.
$$r = 2 \sin \theta$$
, $\theta = \pi/6$ **48.** $r = 2 - \sin \theta$, $\theta = \pi/3$

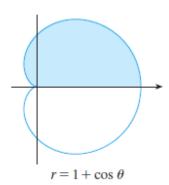
49.
$$r = 1/\theta$$
, $\theta = \pi$

49.
$$r = 1/\theta$$
, $\theta = \pi$ **50.** $r = \cos(\theta/3)$, $\theta = \pi$

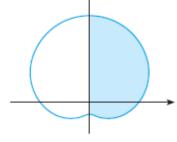
Ex 9.4

5-8 ■ Find the area of the shaded region.

6.

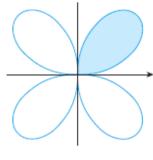


7.



 $r = 4 + 3 \sin \theta$

8.



 $r = \sin 2\theta$

15-18 ■ Find the area of the region enclosed by one loop of the curve.

15.
$$r = 4 \cos 3\theta$$

16.
$$r^2 = \sin 2\theta$$

17.
$$r = 1 + 2 \sin \theta$$
 (inner loop)

18.
$$r = 2 \cos \theta - \sec \theta$$

19-22 Find the area of the region that lies inside the first curve and outside the second curve.

19.
$$r = 2\cos\theta$$
, $r = 1$

20.
$$r = 1 - \sin \theta$$
, $r = 1$

21.
$$r = 3\cos\theta$$
, $r = 1 + \cos\theta$

22.
$$r = 2 + \sin \theta$$
, $r = 3 \sin \theta$

33–36 ■ Find the exact length of the polar curve.

33.
$$r = 3 \sin \theta$$
, $0 \le \theta \le \pi/3$

34.
$$r = e^{2\theta}, \quad 0 \le \theta \le 2\pi$$

35.
$$r = \theta^2$$
, $0 \le \theta \le 2\pi$ **36.** $r = 2(1 + \cos \theta)$

36.
$$r = 2(1 + \cos \theta)$$