Polar Graphs, areas, arclength and graph recognition Polar Wksht #2

What is the general shape of the graph? make a rough sketch no calculators

(1) $r = 5 - 3\sin\theta$

(2) $r = 3\cos 7\theta$

(3) $r = 2 + 5\cos\theta$

(4) $r^2 = 4\sin 2\theta$

(5) $r = 3\sin 4\theta$

(6) $r = 1 + \sin\theta$

(7) $r = 3 - 2\cos\theta$

(8) $r = 5\cos\theta$

(9) $r = 3\sin\theta$

(10) $r = 4\sec\theta$

(11) $r = -2\csc\theta$

(12) $r^2 = 3\cos 2\theta$

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(13) a) what is the formula for finding the area under a polar graph?

b) what is the formula for polar arclength?

(14) Find the area enclosed by the cardiod $r = 2(1+\cos\theta)$

(15) Find the area of the region that lies inside the circle $r = 1$ and outside the cardiod $r = 1 - \cos\theta$ (set up integral, then use fnint)

(16) Find the area inside the cardiod $r = a(1+\cos\theta)$ $a > 0$

(17) Find the area inside the smaller loop of the limaçon $r = 2\cos\theta + 1$ (fnint)

(18) Find area inside one leaf of $r = \cos 2\theta$

(19) inside the lemniscate $r^2 = 6\cos 2\theta$ to the right of the line $r = \frac{3}{2}\sec\theta$

Find the length of the curve:

(20) the cardiod $r = 1 + \cos\theta$

(21) the curve $r = a\sin^2\left(\frac{\theta}{2}\right)$; $0 \le \theta \le \pi$ $a > 0$

(22) the curve $r = \cos^3\left(\frac{\theta}{3}\right)$ $0 \le \theta \le \pi/4$