AP Calculus BC – Unit 8 Extra Practice

8.1 – Extra Practice

Identify the type of each conic section.

#7b. $3x^2 - 5y^2 - 10y - 80 = 0$

#8b. $3x^2 + 4y^2 - 8y - 116 = 0$

#9b. $-2x^2 + 20x + y - 47 = 0$

#10b. $9x^2 + 49y^2 + 291y = 0$

#11b. $x^2 + y^2 - 4x + 8y + 19 = 0$

#12b. $-x^2 + y^2 - 2x + 2y - 4 = 0$

Identify the center and radius of each circle.

#13b. $(x-5)^2+(y-2)^2=25$

#14b. $(x+13)^2+(y-5)^2=13$

Sketch the conic section already in standard form.

#15b. $\frac{(x+2)^2}{81}+\frac{(y-10)^2}{4}=1$

#16b. $\frac{(x-4)^2}{16}-\frac{(y+3)^2}{9}=1$

#17b. $\frac{(y-3)^2}{16}-\frac{(x+1)^2}{4}=1$

#18b. $(y+2)^2=-8(x-4)$

Convert the equation to standard form and sketch.

#19b. $x^2 + y^2 + 6x + 6y + 2 = 0$

#20b. $-x^2 + 25y^2 - 150y + 200 = 0$

#21b. $4x^2 + y^2 - 2y - 35 = 0$

#22b. $y^2 + x - 5 = 0$

8.2 – Extra Practice

Sketch the curve of the parametric equation by either converting the equation to rectangular form, or using a table, then use your calculator to verify your sketch.

#9b. $x = 5 - 4t, \quad y = 2 + 5t$

#10b. $x = t^2, \quad y = t^4 + 1$

#11b. $x = t + 2, \quad y = \dfrac{t}{t-1}$

Sketch the curve of the parametric equation by either converting the equation to rectangular form, or using a table, then use your calculator to verify your sketch.

#12b. $x = \cos(\theta), \quad y = 2\sin(2\theta)$

#13b. $x = t^3, \quad y = 3\ln(t)$

8.3 day 1 – Extra Practice

Find $\frac{dy}{dx}$ for the given parametric equations.

#2b. $x=\sqrt[3]{t},\quad y=4-t$

#3b. $x=2e^{\theta},\quad y=e^{\left(-\frac{1}{2}\theta\right)}$

Find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ and find the slope and concavity (if possible) at the given value of the parameter.

#4b. $x=\sqrt{t},\quad y=3t-1\quad (at\ \ t=1)$

#5b. $x=\cos(\theta),\quad y=3\sin(\theta)\quad (at\ \ t=0)$

Find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ and find the slope and concavity (if possible) at the given value of the parameter.

#6b. $x=\sqrt{t+1},\quad y=\sqrt{t-1}\quad (at\ \ t=2)$

Find the equations of the tangent lines at the point where the curve crosses itself.

#7b. $x = t^2 - t, \quad y = t^3 - 3t - 1$

Find all points (if any) of horizontal or vertical tangency to the curve.

#8b. $x = t + 1, \quad y = t^2 + 3t$

Find all points (if any) of horizontal or vertical tangency to the curve.

#9b. $x = \cos(\theta), \quad y = 2\sin(2\theta)$

Determine the open t-intervals on which the curve is concave up or concave down.

#10b. $x = t^2, \quad y = \ln(t)$

8.3 day 2 – Extra Practice

Find the arc length of the curve on the given interval.

#2b. $x = 6t^2, \quad y = 2t^3 \qquad (1 \le t \le 4)$

#3b. $x = \arcsin(t), \quad y = \ln\left(\sqrt{1-t^2}\right) \qquad \left(0 \le t \le \frac{1}{2}\right)$