0
17
12
0
12
4
45

F. R. Crawford.

$$\frac{1}{2}a^2\int \cos 2\varphi \, d\varphi$$

$$\frac{1}{4}a^2\int \cos 2\varphi \, d2\varphi = \frac{1}{4}a^2 \sin 2\varphi$$

$$= a^2$$

I hereby certify that I have neither given nor received any aid on this exam. F. R. Crawford.

$$y^2 = \frac{x^2(a+x)}{a-x} \qquad x = x' - a$$

$$y^2 = \frac{(x-a)^2(x)}{2a-x}$$

$$2ay^2 - xy^2 = (x^2 - 2ax + a^2)x$$

$$2ay^2 - xy^2 = x^3 - 2ax^2 + a^2x$$

$$\cancel{2a(x^2+y^2) = x^3 - 2ax^2 + a^2x}$$

$$2a(x^2+y^2) = x^3 + xy^2 + a^2x$$

$$x = r\cos\varphi \qquad y = r\sin\varphi$$

$$2a(r^2\cos^2\varphi + r^2\sin^2\varphi) = r^3\cos^3\varphi + r^3\cos\varphi\sin^2\varphi + a^2r\cos\varphi$$

$$2ar^2 = r^3\cos^3\varphi + r^3\cos\varphi\sin^2\varphi + a^2r\cos\varphi$$

$$2ar = r^2\cos^3\varphi + r^2\cos\varphi\sin^2\varphi + a\cos\varphi$$

$$2ar = r^2\cos\varphi(1) + a\cos\varphi$$

$$2ar\cos\varphi = r^2\cos^2\varphi + a\cos^2\varphi$$

$$r^2\cos^2\varphi - 2ar\cos\varphi + a^2 = a^2(1-\cos^2\varphi)$$

$$r\cos\varphi - a = \pm(a\sin\varphi)$$

$$r\cos\varphi = a \pm a\sin\varphi$$

$$r = \frac{a}{\cos\varphi} \pm a\frac{\sin\varphi}{\cos\varphi}$$

$$r = a(\sec\varphi \pm \tan\varphi)$$