Answers to Even Exercises, Homework Set 12

Section 13.1 # 12 IV

14 III

16 I

18 II

30 III

32 I

Section 13.2 # 6 $\cos(1) + \cos(2) - \sin(3)$ Note: $\cos(-x) = \cos(x)$

26(a) 0

28 $m = 2r^2$ and $(\bar{x}, \bar{y}) = \left(\frac{r(\pi+2)}{8}, \frac{r(\pi+2)}{8}\right)$

42 Since $\vec{B}$ is tangent to any circle that lies in the plane perpendicular to the wire, $\vec{B} = |\vec{B}|\vec{T}$ where $\vec{T}$ is the unit tangent to the circle C: $x = r\cos t$, $y = r\sin t$. Thus $\vec{B} = |\vec{B}\langle -\sin t, \cos t\rangle$. Thus $\int_C \vec{B} \cdot d\vec{r} = 2\pi r|\vec{B}|$. Ampere's Law states that $\int_C \vec{B} \cdot d\vec{r} = \mu_0 I$, so $|\vec{B}| = \mu_0 I/(2\pi r)$.