18.1

2: Positive.

4: Positive.

6: Zero.

8:

$$\begin{aligned}\int_C \vec{F} \cdot d\vec{r} &= \int_0^5 2 \; dx \\ &= 10\end{aligned}$$

20:

$$\int_C \begin{pmatrix} 2x \\ 3y \end{pmatrix} \cdot d\vec{r} = 0$$

28:

- C_1: Positive.
- C_2: Zero.
- C_3: Zero.

30:

- C_1: Zero.
- C_2: Zero.
- C_3: Zero.

48: $\int_{C_2} 3\vec{G} \cdot d\vec{r} = 45$

50: $\int_{C_1+C_2} (\vec{G} - \vec{F}) \cdot d\vec{r} = 15$

18.2

2:

$$\int_C \vec{F} \cdot d\vec{r} = \int_{\pi/2}^{-\pi/2} \cos^2(t) - \sin^2(t) \; dt$$

10:

$$\begin{aligned}\int_C \vec{F} \cdot d\vec{r} &= \int_1^5 2t \; dt \\ &= 24\end{aligned}$$

12:

$$\begin{aligned}\int_C \vec{F} \cdot d\vec{r} &= -\int_0^{\pi/2} dt \\ &= -\frac{\pi}{2}\end{aligned}$$

14:

$$\begin{aligned}\int_C \vec{F} \cdot d\vec{r} &= \int_0^2 2t\cos(t) - t^2\sin(t) \; dt \\ &= 4\cos(2)\end{aligned}$$

18:

22:

24:

30:

34:

38: