

Final Project — Chapter 16

Michael Brodskiy

Professor: V. Cherkassky

July 18, 2020

Page 1148

41. #5

(a)

42. #6

(a)

43. #7

(a)

Page 1149

44. #1

(a) The work is negative because it is done in a direction opposing the vector field.

45. #3

(a) The work is as follows:

$$\begin{aligned} & \int_0^\pi 9 \cos^2(t) \sin(t) \sqrt{10} \, dt \\ u = \cos(t) & \implies du = -\sin(t) dt \\ & - \int_1^{-1} 9u^2 \sqrt{10} \\ & -\sqrt{10} \left(3u^3 \Big|_1^{-1} \right) \implies -\sqrt{10}(-6) \\ & 6\sqrt{10} \end{aligned}$$

46. #5

(a) The work is as follows:

$$\begin{aligned} & \int_{-1}^1 -t^4 - 2t^2 + 1 \, dt \\ & \left. -\frac{1}{5}t^5 - \frac{2}{3}t^3 + t \right|_{-1}^1 \\ & \frac{2}{15} + \frac{2}{15} \implies \frac{4}{15} \end{aligned}$$

47. #7

(a) The work is as follows:

$$x = 2t + 1, y = 4t, z = 3t - 1$$

$$\begin{aligned} & \int_0^1 116t^2 - 4t \, dt \\ & \left. \frac{116}{3}t^3 - 2t^2 \right|_0^1 \\ & \frac{110}{3} \end{aligned}$$

48. #11

(a)

49. #13

(a)

50. #15

(a)