Name: Grade: /10

Math 102, Calculus II, Spring 2024, Sec. 3 & 13, HTK
Quiz 4, Tue., Mar. 26

1. Find the equation of the plane that contains the points $(1, 2, 3)$ and $(3, 2, 1)$ and that is parallel to the line $\mathbf{r} = a\mathbf{i} + b\mathbf{j} + c\mathbf{k} + t(3\mathbf{i} + 4\mathbf{j} + 5\mathbf{k})$.

1. Find the equation of the plane that contains the points $(3, 4, 5)$ and $(5, 4, 3)$ and that is parallel to the line $\mathbf{r} = \alpha\mathbf{i} + \beta\mathbf{j} + \gamma\mathbf{k} + t(\mathbf{i} + 2\mathbf{j} + 3\mathbf{k})$.

1. Find the equation of the plane that contains the points $(3, 5, 7)$ and $(7, 5, 3)$ and that is parallel to the line $\mathbf{r} = a\mathbf{i} + b\mathbf{j} + c\mathbf{k} + t(-1\mathbf{i} + 2\mathbf{j} + 5\mathbf{k})$.

1. Find the equation of the plane that contains the points $(-1, 2, 5)$ and $(5, 2, -1)$ and that is parallel to the line $\mathbf{r} = \alpha\mathbf{i} + \beta\mathbf{j} + \gamma\mathbf{k} + t(3\mathbf{i} + 5\mathbf{j} + 7\mathbf{k})$.

2. Find the length of the curve $\mathbf{r}(t) = e^t \cos t\,\mathbf{i} + e^t \sin t\,\mathbf{j} + 8\mathbf{k}$, $0 \le t \le 1$.

2. Find the length of the curve $\mathbf{r}(t) = t\cos t\,\mathbf{i} + t\sin t\,\mathbf{j} + \frac{2\sqrt{2}}{3}t^{3/2}\mathbf{k}$, $0 \le t \le 1$.