

$$1. \quad x+y-z=5$$

$$x+y-5=z$$

$$(2, 3, -5) \quad (x, y, x+y-5)$$



$$d = \sqrt{(x-2)^2 + (y-3)^2 + (x+y-5-(-5))^2}$$

$$d = \sqrt{(x-2)^2 + (y-3)^2 + (x+y)^2}$$

$$D = (x-2)^2 + (y-3)^2 + (x+y)^2$$

$$D_x = 2(x-2)' + 2(x+y)'$$

$$= 2x - 4 + 2x + 2y$$

$$= 4x + 2y - 4$$

$$4x + 2y - 4 = 0$$

$$4x + 2y = 4$$

$$2x + y = 2$$

$$y = 2 - 2x$$

$$D_y = 2(y-3)' + 2(x+y)'$$

$$= 2y - 6 + 2x + 2y$$

$$= 2x + 4y - 6$$

$$2x + 4y - 6 = 0$$

$$2x + 4y = 6$$

$$x + 2y = 3$$

$$x + 2(2 - 2x) = 3$$

$$x + 4 - 4x = 3$$

$$-3x + 4 = 3$$

$$-3x = 3 - 4$$

$$-3x = -1$$

$$x = \frac{1}{3}$$

$$y = 2 - 2x$$

$$y = 2 - 2\left(\frac{1}{3}\right)$$

$$y = \frac{6}{3} - \frac{2}{3}$$

$$y = \frac{4}{3}$$

$$z = x + y - 5$$

$$z = \frac{1}{3} + \frac{4}{3} - \frac{15}{3}$$

$$z = \frac{-10}{3}$$

MIN AT POINT $\left(\frac{1}{3}, \frac{4}{3}, -\frac{10}{3}\right)$

$$d = \sqrt{(x-2)^2 + (y-3)^2 + (x+y)^2}$$

$$d = \sqrt{\left(\frac{1}{3}-2\right)^2 + \left(\frac{4}{3}-3\right)^2 + \left(\frac{1}{3} + \frac{4}{3}\right)^2}$$

$$d = \sqrt{\left(-\frac{5}{3}\right)^2 + \left(-\frac{5}{3}\right)^2 + \left(\frac{5}{3}\right)^2}$$

$$d = \sqrt{\frac{25}{9} + \frac{25}{9} + \frac{25}{9}}$$

$$d = \sqrt{\frac{75}{9}}$$

$$d = \frac{\sqrt{75}}{\sqrt{9}}$$

$$d = \frac{5\sqrt{3}}{3}$$