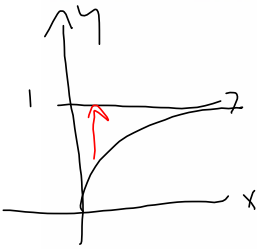


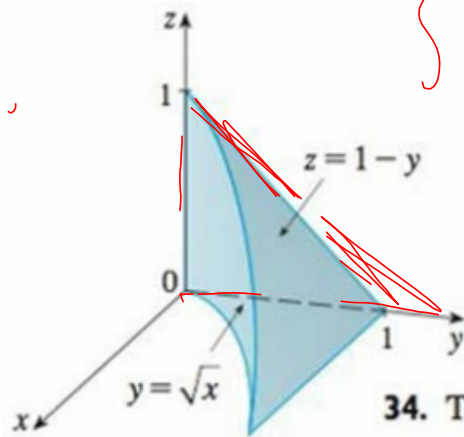
$$\int_0^1 \int_{\sqrt{x}}^1 \int_0^{1-y} f(x, y, z) dz dy dx$$

Rewrite this integral as an equivalent iterated integral in the five other orders.

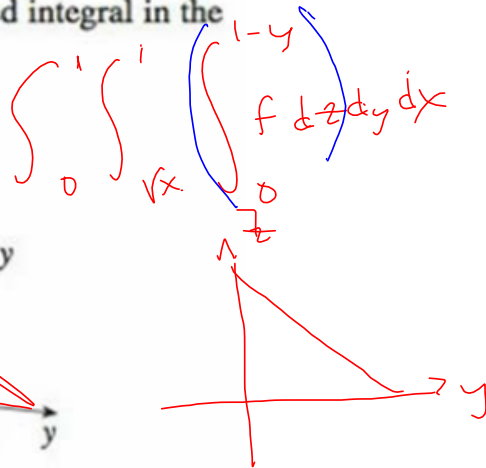


$$\iiint f dy dz dx$$

$$\int_0^1 \int \int f dy$$



34. The figure show:



Next time: Wednesday. I want YOU to be checking your work on the Applications (15.5 in the handouts) using Maple.

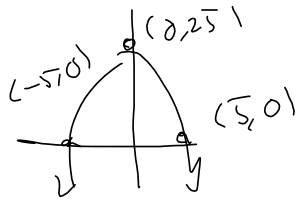
#1  $\sqrt{y-1} + \sqrt{25-x^2}$

$y-1 \geq 0$

$y \geq 1$

$25-x^2 \geq 0$

$x \in [-5, 5]$

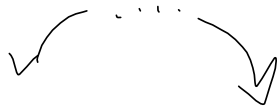


$25-x^2 \geq 0$   
 $(5-x)(5+x) \geq 0$



N Y Y Y N

$x \in [-5, 5]$



$25-x^2 \geq 0$

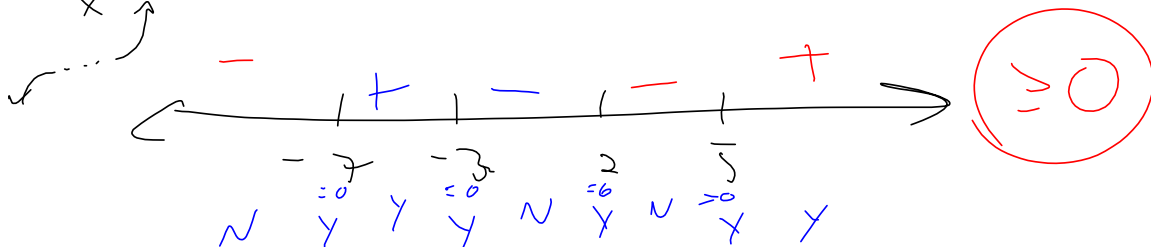
$x^2 - 25 \leq 0$

$(x-5)(x+5) \leq 0$



want:

$(x-2)^4 (x+3)(x-5)(x+7)^3 \geq 0$



$x \in [-7, -3] \cup \{2\} \cup [5, \infty)$

$$P(2,3,7) \text{ to } 2x - y + 3z = 6 : \mathcal{P}$$

② Let  $Q(x,y,z) \in \mathcal{P}$ . Then  $d(P,Q) = \sqrt{(x-2)^2 + (y-3)^2 + (z-7)^2}$  is to be minimized.

Let  $d^2 = f(x,y,z) = (x-2)^2 + (y-3)^2 + (z-7)^2$ . Now get rid of

y using  $\mathcal{P}$ .  
 $Q \in \mathcal{P}$ .

$$h(x,y) = (x-2)^2 + (2x+3z-6-3)^2 + (z-7)^2$$

is to be minimized

$$(x-2)^2 + (2x+3z-9)^2 + (z-7)^2 \rightarrow$$

$$h_x = 2(x-2) + 2(2x+3z-9)(2)$$

$$= 2x-4 + 8x + 12z - 36$$

$$= 10x + 12z - 40 \stackrel{\text{Set}}{=} 0$$

$$\rightarrow 5x + 6z - 20 = 0$$

$$\Rightarrow 5x = -6z + 20$$

$$\Rightarrow x = -\frac{6}{5}z + 4$$

$$h_z = 2(2x+3z-9)(3) + 2(z-7)$$

$$= 12x + 18z - 54 + 2z - 14$$

$$= 12x + 20z - 68 \stackrel{\text{Set}}{=} 0$$

$$\Rightarrow 6x + 10z = 34$$

$$6x = -10z + 34$$

$$x = \frac{-10z + 34}{6} = \frac{-5z + 17}{3}$$

$$x = -\frac{2}{7}$$

$$y = \frac{29}{7}$$

$$z = \frac{25}{7}$$