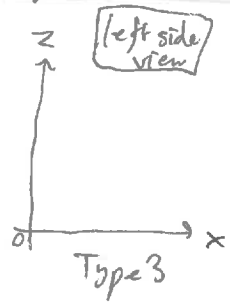
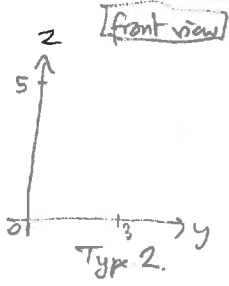
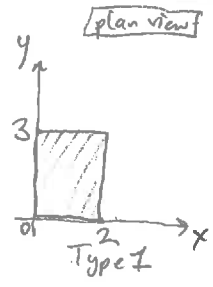
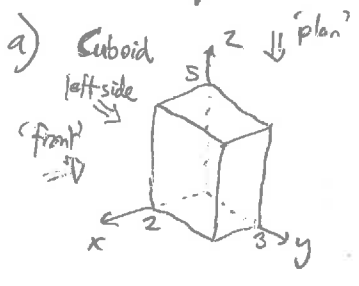


MATH 11 WORKSHEET : Triple integral domains

Solid region E:

sketch 'shadow' on each plane (2d region D):

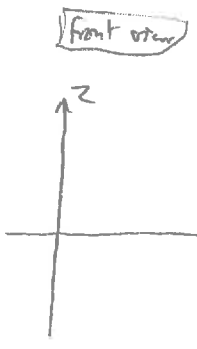
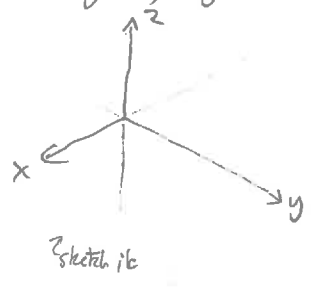
Write a Type 1 triple integral of f:



$$\int_0^2 \int_0^3 \int_0^5 f \, dz \, dy \, dx$$

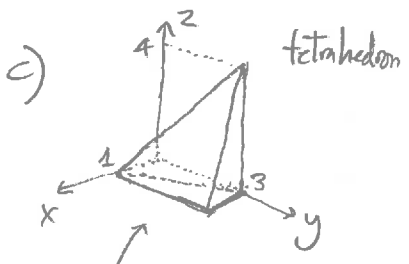
defines D (Type 1 case) z-limits due to 'needle' sticking in at (x,y).

b) region bounded by $x^2 + z^2 = 4$, $y=0$, $y=6$

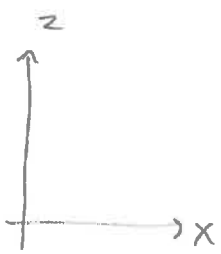
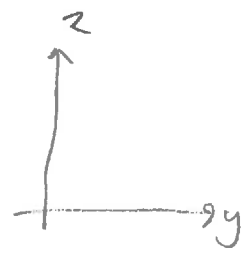
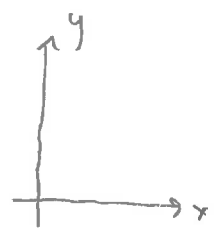


put limits!

$$\iiint f \, dz \, dy \, dx$$

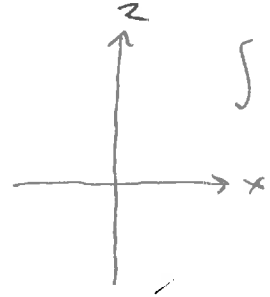
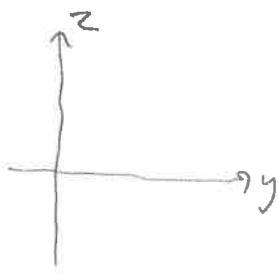
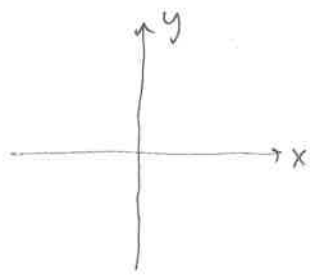
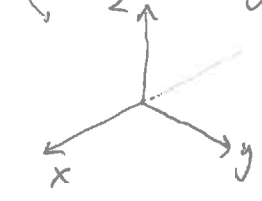


top plane is $4x + z = 4$



$$\iiint f \, dz \, dy \, dx$$

d) region bounded by $z=0$, $z=y$, $x^2 = 1-y$



$$\iiint f \, dz \, dy \, dx$$

e) rewrite b) using Type 3 limits:

[what would be easier way to do the dx dz remaining integral?]

SOLUTIONS

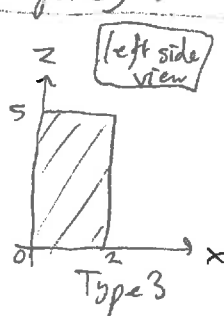
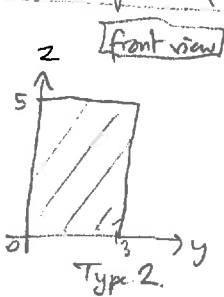
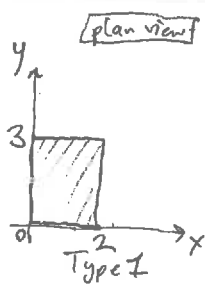
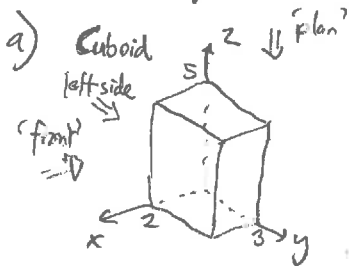
10/27/10
Bennett

MATH 11 WORKSHEET: Triple integral domains

Solid region E:

sketch 'shadow' on each plane (2d region D):

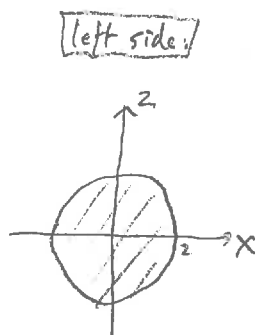
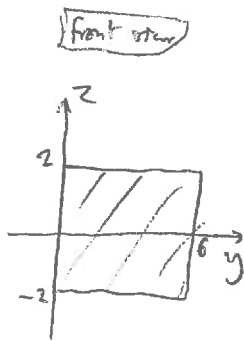
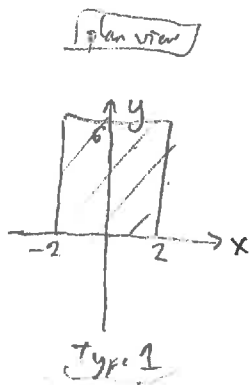
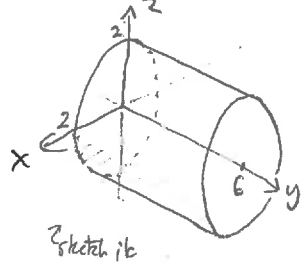
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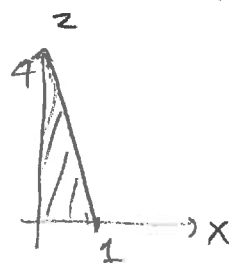
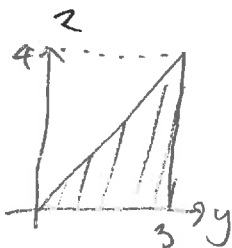
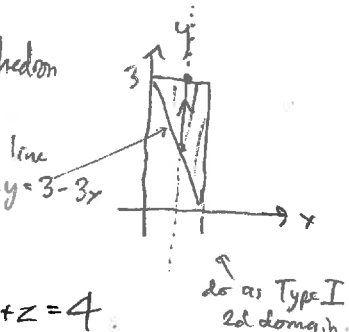
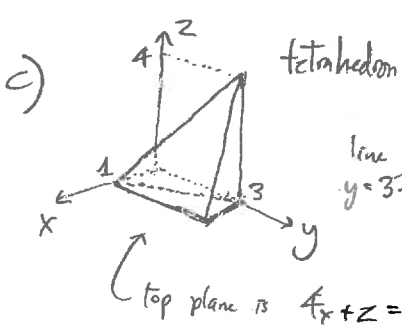


put limits!

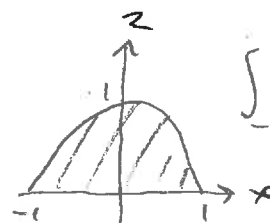
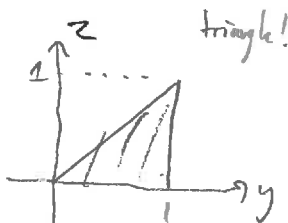
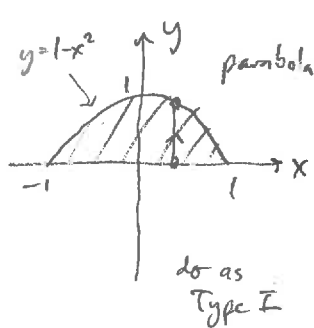
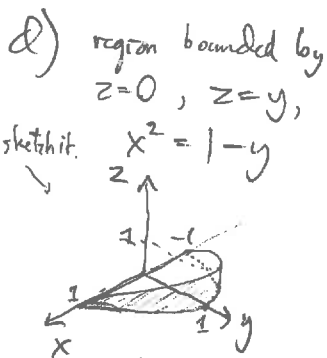
$$\int_{-2}^2 \int_0^6 \int_{-\sqrt{4-x^2}}^{\sqrt{4-x^2}} f \, dz \, dy \, dx$$

since stick needle into $[-2, 2]$ for general x,y:

given domain D in (x,y).



$$\int_0^1 \int_{3-3x}^3 \int_0^{4-4x} f \, dz \, dy \, dx$$



$$\int_{-1}^1 \int_0^{1-x^2} \int_0^y f \, dz \, dy \, dx$$

e) rewrite b) using Type 3 limits:

$$\int_{-2}^2 \int_{-\sqrt{4-x^2}}^{\sqrt{4-x^2}} \int_0^6 f \, dy \, dx \, dz$$

could do as polar:

(which would be easier to do the double integral) → do in polar in the xz plane.