practice with double integral limits of integration

Analyze these double integrals, drawing a diagram as explained by bob that illustrates both the region of integration and the order of integration and limits of integration, then reverse the order of integration drawing a new diagram and then from it deduce the new iteration. [Evaluating both might confirm they are correct, but if they don't agree, surely your second iteration is wrong.]

15.2.2

> $\int_0^2 \int_0^{y^2} 1 \, dx \, dy$

15.2.56

> $\int_0^2 \int_{x^2}^4 1 \, dy \, dx$

15.2.58

> $\int_{-2}^2 \int_0^{\sqrt{4-y^2}} 1 \, dx \, dy$

15.2.66

> $\int_0^8 \int_{\sqrt[3]{y}}^2 1 \, dx \, dy$

Find the area of the region (integrand equals 1) enclosed by the curves $x = y + 2$, $x = y^2$.
Set up a *dx dy* integration order and iteration first, then redraw for the opposite order.

Find the volume enclosed by the following surfaces:
[Hint: the conditions on z are just the floor and ceiling of the solid object, only the rest are relevant to the region of integration.]

15.2.34
The paraboloid $z = x^2 + y^2 + 1$ and the planes $z = 0$, $y = 0$, $z = 0$, $x + y = 2$

15.2.37
The parabolic cylinders $z = x^2$, $y = x^2$, and the planes $z = 0$, $y = 4$

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