Problems

(1) Consider the region bounded by the graphs $y = x^2$, $y = 4$ and $x = 0$. We will use this region for the next few problems.

(a) Sketch this region.

(b) Rotate this region about the $y$–axis, sketch the solid and calculate its volume using disks.
(c) Rotate this region about the $y$–axis, sketch the solid and calculate its volume using shells (tubes).

(d) Rotate this region about the $x$–axis, sketch the solid and calculate its volume using disks.
(e) Rotate this region about the $x$–axis, sketch the solid and calculate its volume using shells (tubes).

(f) Rotate this region about the line $x = -1$, sketch the solid and calculate its volume using washers/CDs.
(g) Rotate this region about the line $x = -1$, sketch the solid and calculate its volume using shells/tubes.

(h) Rotate this region about the line $y = 5$, sketch the solid and calculate its volume using washers/CDs.
(i) Rotate this region about the line $y = 5$, sketch the solid and calculate its volume using shells/tubes.

(j) Rotate this region about the line $x = 3$, sketch the solid and calculate its volume using either method.
(k) Rotate this region about the line $y = -1$, sketch the solid and calculate its volume using either method