Homework .

7.10 π
7.11 $3\pi/32$
7.12 $\pi/4\sqrt{2}$
7.14 $-\sin(2)\pi/e$.
7.15 $\pi e^{-4/3}/12$
7.29 $\pi/2$
7.30a $\pi/2\sqrt{2}$
7.33 $\pi/\sqrt{2}$
7.34 $\pi/2$
7.43 $z^3 + z^2 + 9$ is real and positive if z is real and positive, has negative imaginary part if z is imaginary with positive imaginary part, and is about z^3 if $|z|$ is large. From these facts it follows as in the lecture that if z travels round a large first quadrant sector then the argument of $z^3 + z^2 + 9$ increases by 2π. By the argument principle this implies that it has exactly one zero in the first quadrant. As its zeros occur in complex conjugate pairs, it also has one in the 4'th quadrant.
8.3 Regular, residue $= -1$
8.5 Regular, residue $= -1$
8.14 $-2\pi i$.