and similarly q is augmented with zeros as the vector

$$q_a = 0_{2(p+q)}.$$

The `Matlab` programs implementing the above method are given in Appendix B, Section B.3. We ran our program on the same input data points used in Section 54.8, namely

```
u16 = 10.1*randn(2,30)+7 ;
v16 = -10.1*randn(2,30)-7;
[~,~,~,~,~,~,w3] = runSVMs3b(0.365,rho,u16,v16,1/60)
```

We picked $K = 1/60$ and various values of ν starting with $\nu = 0.365$, which appears to be the smallest value for which the method converges; see Figure 54.16.

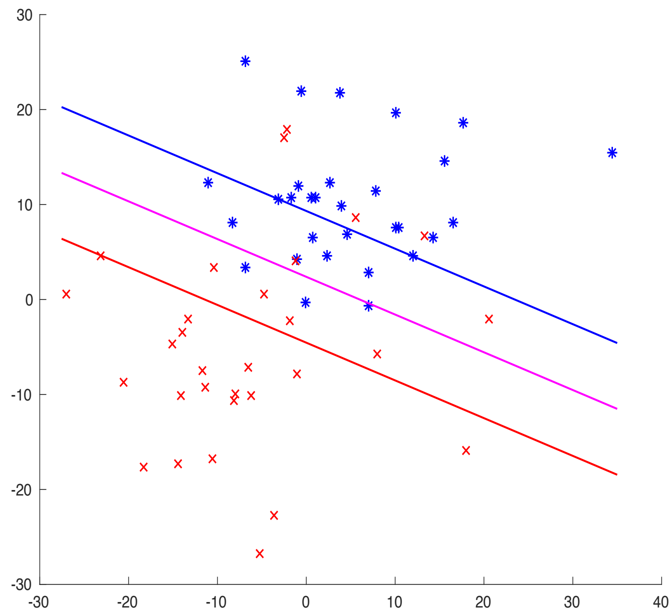

Figure 54.16: Running (SVM_{s3}) on two sets of 30 points; $\nu = 0.365$.

We have $p_f = 10, q_f = 10, p_m = 12$ and $q_m = 11$, as opposed to $p_f = 10, q_f = 11, p_m = 12, q_m = 12$, which was obtained by running $(\mathrm{SVM}_{s2'})$; see Figure 54.11. A slightly narrower margin is achieved.

Next we ran our program with $\nu = 0.5$, see Figure 54.17. We have $p_f = 13, q_f = 16, p_m = 14$ and $q_m = 17$.

We also ran our program with $\nu = 0.71$, see Figure 54.18. We have $p_f = 21, q_f = 21, p_m = 22$ and $q_m = 22$. The value $\nu = 0.7$ is a singular value for which there are no support vectors and $\nu = (p_f + q_f)/(p + q)$.