1) i// $3 - 2 + 4q = 0$

$1 + 4q = 0$

$4q = -1$

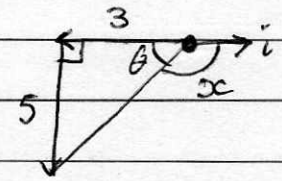
$q = -1/4$

ii// $2p + 5 + 5 = 0$

$2p = -10$

$p = -5$

2a)



$\tan\theta = \frac{5}{3}$

$\theta = \tan^{-1}\left(\frac{5}{3}\right)$

$= 59°$

$x = 180 - 59$

$= 121°$ (nearest degree)

b) $F = ma$

$= 0.8(-3i + 5j)$

$= -\frac{12}{5}i + 4j$

$\sqrt{\left(\frac{12}{5}\right)^2 + (4)^2}$

$= \frac{4\sqrt{34}}{5}$ N or 4.66 N (3sf)

3a/ $v = u + at$

$7i + 2j = -2i + 6j + 4a$

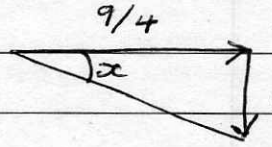
$9i - 4j = 4a$

$a = \frac{9}{4}i - j \quad ms^{-2}$

$\sqrt{\left(\frac{9}{4}\right)^2 + (1)^2}$

$= 2.46 \ ms^{-2} \ (3sf)$

b/



$\tan x = \frac{1}{9/4}$

$x = \tan^{-1}\left(\frac{1}{9/4}\right)$

$= 24.0°$

4/ i// $2p + 3q = 1 \quad (1)$

ii// $-4q + 4p = -14 \quad (2)$

$-2q + 2p = -7$

$2p = (-7 + 2q)$

Sub into (1) $-7 + 2q + 3q = 1$

$-7 + 5q = 1$

$5q = 8$

$q = 8/5$

$2p + 3\left(\frac{8}{5}\right) = 1$

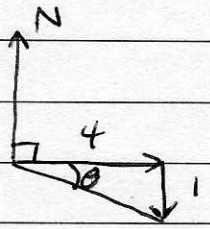
$2p + 24/5 = 1$

$2p = -\frac{19}{5}$

$p = \frac{-19}{10}$

5a) $\sqrt{4^2 + 1^2} = \underline{\underline{\sqrt{17}\ ms^{-1}}}$

b)



$\theta = \tan^{-1}\left(\frac{1}{4}\right)$

$= 14°$

$90 + 14 = \underline{\underline{104°}}$

6) s

$u = ?$

$v = -5i + 2j$

$a = 3i - 4j$

$t = 3$

$v = u + at$

$-5i + 2j = u + 3(3i - 4j)$

$-5i + 2j = u + 9i - 12j$

$u = \underline{\underline{-14i + 14j}}$

7) $(3i - 2j) + (pi + 2pj) = k(i + j)$

$(3 + p)i + (-2 + 2p)j = k(i + j)$

$3 + p = k \qquad -2 + 2p = k$

$3 + p = -2 + 2p$

$\underline{\underline{5 = p}}$