

## MISCELLANEOUS EXERCISES—Continued.

33.  $x^2 + y^2 + 2fx + 2fy + 2f^2 - y^2 - f^2 = 0$ .
35.  $2x - (b+c)y + 2abc = 0$ .
37.  $-\frac{\sqrt{13}}{4}$ .
40.  $19x^2 - 60xy + 44y^2 = 0$ .
41.  $3x^2 - 8xy - 3y^2 = 0$ .
42.  $\tan^{-1} \frac{8\sqrt{243}}{23}$ .
43.  $y = 2$  and  $15x + 8y = 31$ .
46.  $(a+c-g, b+d-h)$ .
49.  $163x + 9y + 54 = 0$  and  $239x - 573y + 1112 = 0$ .
67.  $x^2 + y^2 - (hx + ky) = 0$ .
69.  $x^2 + y^2 - 10x + 9 = 0$ .
74.  $\cos^{-1} \frac{17}{20}$ .
76. The circle  $3(x^2 + y^2) + 8x + 10y = 92$ .
77.  $3(x^2 + y^2) - 2a(x+y) = 2a^2$ .
81.  $\frac{c^2 - b^2}{2m}$ .
85.  $y^2 - x^2 = 0$ .
86.  $x^2 + y^2 - 2a(x+y) + a^2 = 0$ .
88.  $x^2 + y^2 = 2(x+y)$ .
92.  $59(x^2 + y^2) - 44(x+2y) = 740$ .
102.  $\left(x - \frac{x_1 + x_2}{2}\right)^2 + \left(y - \frac{y_1 + y_2}{2}\right)^2 = \frac{a^2}{4}$ .
105.  $-\frac{bc+ca+ab}{a+b+c}, \frac{a^2+b^2+c^2+bc+ca+ab}{a+b+c}$ .
108.  $(k^2 - d^2)x^2 - 2hkxy + (h^2 - d^2)y^2 = 0$ .
109.  $18 - \frac{4x}{5} - \frac{3y}{5}, \frac{6 - 3x + 4y}{5}, x^2 + y^2 - 6x - 4y + 8 = 0$ .