18.7. Solve: **(a)** In tabular form we have

Particle	v_x (m/s)	v_y (m/s)	v_x^2 (m/s)^2	v_y^2 (m/s)^2	v^2 (m/s)^2	v (m/s)
1	20	30	400	900	1300	36.06
2	–40	70	1600	4900	6500	80.62
3	–80	–10	6400	100	6500	80.62
4	60	–20	3600	400	4000	63.25
5	0	–50	0	2500	2500	50.00
6	40	–20	1600	400	2000	44.72
Average	0	0			3800	59.20

The average velocity is $\vec{v}_{\text{avg}} = \vec{0}\,\hat{i} + \vec{0}\,\hat{j}$.

(b) The average speed is $v_{\text{avg}} = 59.2 \text{ m/s}$.

(c) The root-mean-square speed is $v_{\text{rms}} = \sqrt{\left(v^2\right)_{\text{avg}}} = \sqrt{3800 \text{ m}^2/\text{s}^2} = 61.6 \text{ m/s}$.