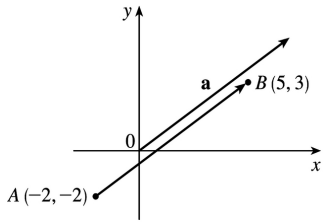
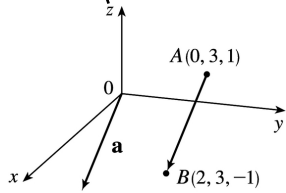


8.  $\mathbf{a} = \langle 5 - (-2), 3 - (-2) \rangle = \langle 7, 5 \rangle$



11.  $\mathbf{a} = \langle 2 - 0, 3 - 3, -1 - 1 \rangle = \langle 2, 0, -2 \rangle$



18.  $|\mathbf{a}| = \sqrt{2^2 + (-3)^2} = \sqrt{13}$

$\mathbf{a} + \mathbf{b} = (2\mathbf{i} - 3\mathbf{j}) + (\mathbf{i} + 5\mathbf{j}) = 3\mathbf{i} + 2\mathbf{j}$

$\mathbf{a} - \mathbf{b} = (2\mathbf{i} - 3\mathbf{j}) - (\mathbf{i} + 5\mathbf{j}) = \mathbf{i} - 8\mathbf{j}$

$2\mathbf{a} = 2(2\mathbf{i} - 3\mathbf{j}) = 4\mathbf{i} - 6\mathbf{j}$

$3\mathbf{a} + 4\mathbf{b} = 3(2\mathbf{i} - 3\mathbf{j}) + 4(\mathbf{i} + 5\mathbf{j})$   
 $= 6\mathbf{i} - 9\mathbf{j} + 4\mathbf{i} + 20\mathbf{j} = 10\mathbf{i} + 11\mathbf{j}$

24.  $|12\mathbf{i} - 5\mathbf{j}| = \sqrt{12^2 + (-5)^2} = \sqrt{169} = 13$ , so  $\mathbf{u} = \frac{1}{13} (12\mathbf{i} - 5\mathbf{j}) = \frac{12}{13} \mathbf{i} - \frac{5}{13} \mathbf{j}$ .