**Самостоятельная работа по теме «Скалярное произведение векторов»**

**Вариант  I**

1. Вычислите скалярное произведение векторов  http://files.school-collection.edu.ru/dlrstore/6a7135c6-c547-4cf6-abed-82df427d0d3e/%5bG79_11-03%5d_%5bTQ_S-03%5d_files/%5bG79_09-03%5d_%5bTQ_S-01-s-01%5d.gif и http://files.school-collection.edu.ru/dlrstore/6a7135c6-c547-4cf6-abed-82df427d0d3e/%5bG79_11-03%5d_%5bTQ_S-03%5d_files/%5bG79_09-03%5d_%5bTQ_S-01-s-02%5d.gif, если http://files.school-collection.edu.ru/dlrstore/6a7135c6-c547-4cf6-abed-82df427d0d3e/%5bG79_11-03%5d_%5bTQ_S-03%5d_files/%5bG79_11-03%5d_%5bTQ_K-01-s-08%5d.gif = 2, http://files.school-collection.edu.ru/dlrstore/6a7135c6-c547-4cf6-abed-82df427d0d3e/%5bG79_11-03%5d_%5bTQ_S-03%5d_files/%5bG79_09-03%5d_%5bTQ_S-01-s-04%5d.gif = 3, а угол между ними равен 120°.  
   2. Скалярное произведение ненулевых векторов http://files.school-collection.edu.ru/dlrstore/6a7135c6-c547-4cf6-abed-82df427d0d3e/%5bG79_11-03%5d_%5bTQ_S-03%5d_files/%5bG79_11-03%5d_%5bTQ_S-03-s-01%5d.gif и http://files.school-collection.edu.ru/dlrstore/6a7135c6-c547-4cf6-abed-82df427d0d3e/%5bG79_11-03%5d_%5bTQ_S-03%5d_files/%5bG79_11-03%5d_%5bTQ_S-03-s-02%5d.gif равно 0. Определите угол между векторами http://files.school-collection.edu.ru/dlrstore/6a7135c6-c547-4cf6-abed-82df427d0d3e/%5bG79_11-03%5d_%5bTQ_S-03%5d_files/%5bG79_11-03%5d_%5bTQ_S-03-s-01%5d.gif и http://files.school-collection.edu.ru/dlrstore/6a7135c6-c547-4cf6-abed-82df427d0d3e/%5bG79_11-03%5d_%5bTQ_S-03%5d_files/%5bG79_11-03%5d_%5bTQ_S-03-s-02%5d.gif.  
   3. Вычислите скалярное произведение векторов http://files.school-collection.edu.ru/dlrstore/6a7135c6-c547-4cf6-abed-82df427d0d3e/%5bG79_11-03%5d_%5bTQ_S-03%5d_files/%5bG79_09-03%5d_%5bTQ_S-01-s-09%5d.gif и http://files.school-collection.edu.ru/dlrstore/6a7135c6-c547-4cf6-abed-82df427d0d3e/%5bG79_11-03%5d_%5bTQ_S-03%5d_files/%5bG79_09-03%5d_%5bTQ_S-01-s-10%5d.gif, если http://files.school-collection.edu.ru/dlrstore/6a7135c6-c547-4cf6-abed-82df427d0d3e/%5bG79_11-03%5d_%5bTQ_S-03%5d_files/%5bG79_09-03%5d_%5bTQ_S-01-s-09%5d.gif {3; –2}, http://files.school-collection.edu.ru/dlrstore/6a7135c6-c547-4cf6-abed-82df427d0d3e/%5bG79_11-03%5d_%5bTQ_S-03%5d_files/%5bG79_09-03%5d_%5bTQ_S-01-s-10%5d.gif {–2; 3}.  
   4. Вычислите косинус угла между векторами http://files.school-collection.edu.ru/dlrstore/6a7135c6-c547-4cf6-abed-82df427d0d3e/%5bG79_11-03%5d_%5bTQ_S-03%5d_files/%5bG79_11-03%5d_%5bTQ_S-03-s-03%5d.gif и http://files.school-collection.edu.ru/dlrstore/6a7135c6-c547-4cf6-abed-82df427d0d3e/%5bG79_11-03%5d_%5bTQ_S-03%5d_files/%5bG79_11-03%5d_%5bTQ_S-03-s-04%5d.gif, если http://files.school-collection.edu.ru/dlrstore/6a7135c6-c547-4cf6-abed-82df427d0d3e/%5bG79_11-03%5d_%5bTQ_S-03%5d_files/%5bG79_11-03%5d_%5bTQ_S-03-s-03%5d.gif {3; –4}, http://files.school-collection.edu.ru/dlrstore/6a7135c6-c547-4cf6-abed-82df427d0d3e/%5bG79_11-03%5d_%5bTQ_S-03%5d_files/%5bG79_11-03%5d_%5bTQ_S-03-s-04%5d.gif {15; 8}.  
   5. Даны векторы http://files.school-collection.edu.ru/dlrstore/6a7135c6-c547-4cf6-abed-82df427d0d3e/%5bG79_11-03%5d_%5bTQ_S-03%5d_files/%5bG79_09-03%5d_%5bTQ_S-01-s-01%5d.gif {2; –3} и http://files.school-collection.edu.ru/dlrstore/6a7135c6-c547-4cf6-abed-82df427d0d3e/%5bG79_11-03%5d_%5bTQ_S-03%5d_files/%5bG79_09-03%5d_%5bTQ_S-01-s-02%5d.gif {*х*; –4}. При каком значении *х* эти векторы перпендикулярны?

**Самостоятельная работа по теме «Скалярное произведение векторов»**

**Вариант  II**

1. Вычислите скалярное произведение векторов http://files.school-collection.edu.ru/dlrstore/6a7135c6-c547-4cf6-abed-82df427d0d3e/%5bG79_11-03%5d_%5bTQ_S-03%5d_files/%5bG79_09-03%5d_%5bTQ_S-01-s-09%5d.gif и http://files.school-collection.edu.ru/dlrstore/6a7135c6-c547-4cf6-abed-82df427d0d3e/%5bG79_11-03%5d_%5bTQ_S-03%5d_files/%5bG79_09-03%5d_%5bTQ_S-01-s-10%5d.gif, если http://files.school-collection.edu.ru/dlrstore/6a7135c6-c547-4cf6-abed-82df427d0d3e/%5bG79_11-03%5d_%5bTQ_S-03%5d_files/%5bG79_09-02%5d_%5bTQ_S-02-s-03%5d.gif = 3, http://files.school-collection.edu.ru/dlrstore/6a7135c6-c547-4cf6-abed-82df427d0d3e/%5bG79_11-03%5d_%5bTQ_S-03%5d_files/%5bG79_09-03%5d_%5bTQ_S-01-s-08%5d.gif = 4, а угол между ними равен 135°.  
   2. Скалярное произведение ненулевых векторов http://files.school-collection.edu.ru/dlrstore/6a7135c6-c547-4cf6-abed-82df427d0d3e/%5bG79_11-03%5d_%5bTQ_S-03%5d_files/%5bG79_11-03%5d_%5bTQ_S-03-s-03%5d.gif и http://files.school-collection.edu.ru/dlrstore/6a7135c6-c547-4cf6-abed-82df427d0d3e/%5bG79_11-03%5d_%5bTQ_S-03%5d_files/%5bG79_11-03%5d_%5bTQ_S-03-s-04%5d.gif равно нулю. Определите угол между этими векторами.  
   3. Вычислите скалярное произведение векторов http://files.school-collection.edu.ru/dlrstore/6a7135c6-c547-4cf6-abed-82df427d0d3e/%5bG79_11-03%5d_%5bTQ_S-03%5d_files/%5bG79_09-03%5d_%5bTQ_S-01-s-01%5d.gif и http://files.school-collection.edu.ru/dlrstore/6a7135c6-c547-4cf6-abed-82df427d0d3e/%5bG79_11-03%5d_%5bTQ_S-03%5d_files/%5bG79_09-03%5d_%5bTQ_S-01-s-02%5d.gif, если http://files.school-collection.edu.ru/dlrstore/6a7135c6-c547-4cf6-abed-82df427d0d3e/%5bG79_11-03%5d_%5bTQ_S-03%5d_files/%5bG79_09-03%5d_%5bTQ_S-01-s-01%5d.gif {–4; 5}, http://files.school-collection.edu.ru/dlrstore/6a7135c6-c547-4cf6-abed-82df427d0d3e/%5bG79_11-03%5d_%5bTQ_S-03%5d_files/%5bG79_09-03%5d_%5bTQ_S-01-s-02%5d.gif {–5; 4).  
   4. Вычислите косинус угла между векторами http://files.school-collection.edu.ru/dlrstore/6a7135c6-c547-4cf6-abed-82df427d0d3e/%5bG79_11-03%5d_%5bTQ_S-03%5d_files/%5bG79_09-03%5d_%5bTQ_S-01-s-01%5d.gif и http://files.school-collection.edu.ru/dlrstore/6a7135c6-c547-4cf6-abed-82df427d0d3e/%5bG79_11-03%5d_%5bTQ_S-03%5d_files/%5bG79_09-03%5d_%5bTQ_S-01-s-02%5d.gif, если http://files.school-collection.edu.ru/dlrstore/6a7135c6-c547-4cf6-abed-82df427d0d3e/%5bG79_11-03%5d_%5bTQ_S-03%5d_files/%5bG79_09-03%5d_%5bTQ_S-01-s-01%5d.gif {–12; 5}, http://files.school-collection.edu.ru/dlrstore/6a7135c6-c547-4cf6-abed-82df427d0d3e/%5bG79_11-03%5d_%5bTQ_S-03%5d_files/%5bG79_09-03%5d_%5bTQ_S-01-s-02%5d.gif {3; 4}.  
   5. Даны векторы http://files.school-collection.edu.ru/dlrstore/6a7135c6-c547-4cf6-abed-82df427d0d3e/%5bG79_11-03%5d_%5bTQ_S-03%5d_files/%5bG79_09-03%5d_%5bTQ_S-01-s-09%5d.gif {3; *у*} и http://files.school-collection.edu.ru/dlrstore/6a7135c6-c547-4cf6-abed-82df427d0d3e/%5bG79_11-03%5d_%5bTQ_S-03%5d_files/%5bG79_09-03%5d_%5bTQ_S-01-s-10%5d.gif {2; –6}. При каком значении *у* эти векторы перпендикулярны?