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$$a) \quad \overrightarrow{AB}(4; 2) \cdot \overrightarrow{AC}(2; -5) = \overrightarrow{AB} \cdot \overrightarrow{AC} (4 * 2 + 2 * (-5)) = -2$$

$$b) \quad \frac{2\pi}{3} = 0.5$$

$$\|\overrightarrow{AB}\| * \|\overrightarrow{AC}\| * \cos(AB, AC) = 2 * 2 * \frac{2\pi}{3} = -2$$

$$c) \quad \|\overrightarrow{AB}\| \cdot \|\overrightarrow{AC}\| = \|\overrightarrow{AB}\| * \|\overrightarrow{AB}\| = 4$$

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$$\overrightarrow{AB}(-2; 4), \overrightarrow{AC}(2; 1)$$

$$\overrightarrow{AB} \cdot \overrightarrow{AC} = -2 * 2 + 4 * 1 = -8$$

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$$a) \quad \overrightarrow{u} \cdot \overrightarrow{v} = 2 * 1 + 3 * (-2) = -4$$

$$b) \quad \frac{2\pi}{3} = -0.5$$

$$\overrightarrow{u} \cdot \overrightarrow{v} = 5 * 2 * \frac{-2\pi}{3} = -5$$

$$c) \quad \overrightarrow{u} \cdot \overrightarrow{v} = \frac{1}{2} (\|\overrightarrow{u + v}\|^2 - \|\overrightarrow{u}\|^2 - \|\overrightarrow{v}\|^2) \\ = \frac{1}{2} (4^2 - 2^2 - 3^2) = \frac{3}{2}$$