3. $\int 3x^2\,(x^3-5)^7\,dx$

$u = x^3 - 5$

$\frac{du}{dx} = 3x^2$

$\int \frac{du}{\cancel{dx}} (u)^7 \cancel{dx}$ $\quad \int u^7\,du$ $\quad \frac{1}{8}u^8 + C$

$\frac{1}{8}(x^3-5)^8 + C$

$\int x(x^2+1)^8\,dx$ $\quad u = x^2+1$

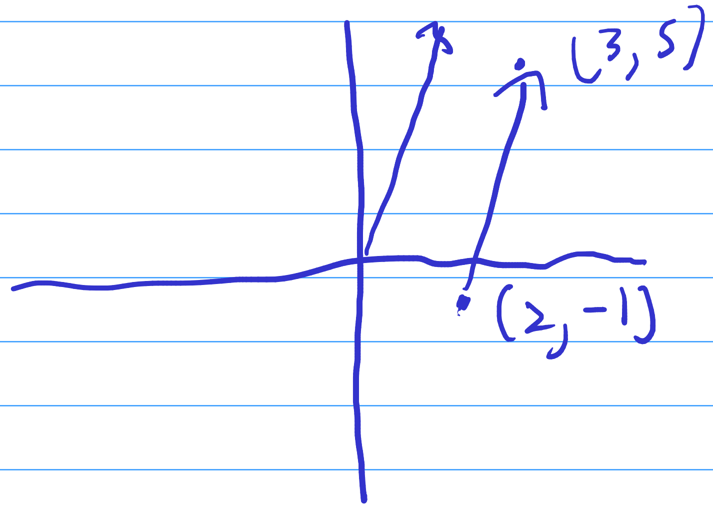
$du = 2x$

$\int \frac{1}{2}\cdot 2x\,(x^2+1)^8\,dx$

$\int \frac{1}{2}\frac{du}{\cancel{dx}} (u)^8 \cancel{dx}$ $\quad \int \frac{1}{2}u^8\,du$

$\frac{1}{18}u^9 + C$

$\frac{1}{18}(x^2+1)^9 + C$



Component

$\langle 1, 6 \rangle$

$\hat{i}$ $\hat{j}$

$\hat{i} + 6\hat{j}$

Standard unit vector

11. Let $\vec{u} = \langle 1, -2 \rangle$ and $\vec{v} = \langle 1, 1 \rangle$.

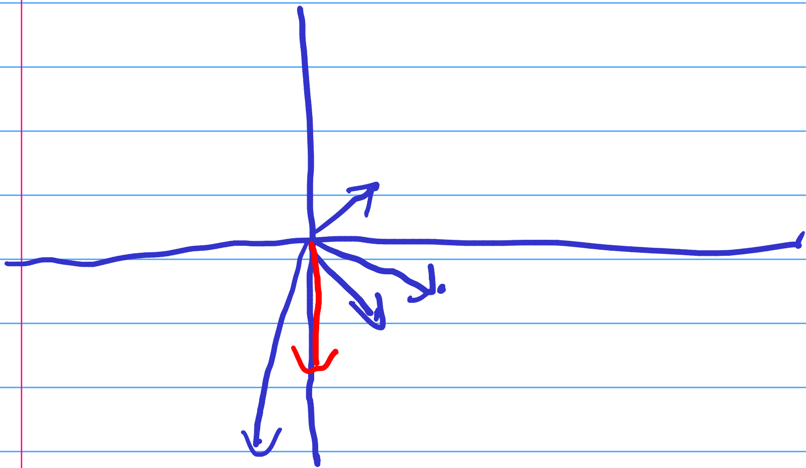
(a) Find $\vec{u} + \vec{v}$, $\vec{u} - \vec{v}$, $2\vec{u} - 3\vec{v}$.

(b) Sketch the above vectors on the same axes, along with $\vec{u}$ and $\vec{v}$.

(c) Find $\vec{x}$ where $\vec{u} + \vec{x} = 2\vec{v} - \vec{x}$.

$\langle 2, -1 \rangle$ $\quad$ $\langle 0, -3 \rangle$ $\quad$ $\langle 2, -4 \rangle - \langle 3, 3 \rangle$

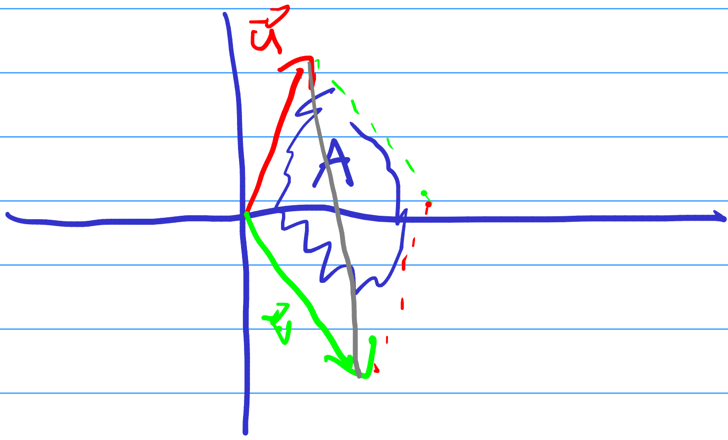
$\langle -1, -7 \rangle$



$\langle 1, -2 \rangle + \vec{x} = \langle 2, 2 \rangle - \vec{x}$

$\langle 1, -2 \rangle + 2\vec{x} = \langle 2, 2 \rangle$

$2\vec{x} = \langle 1, 4 \rangle$ $\qquad$ $\vec{x} = \langle \frac{1}{2}, 2 \rangle$

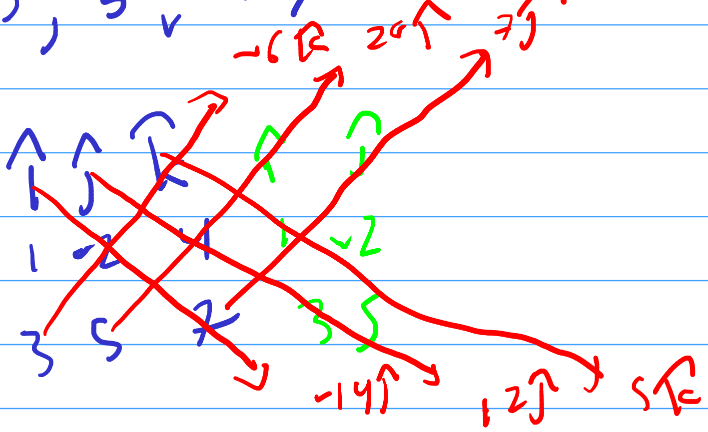


$\frac{1}{2} ab \sin \theta$

$\|u\| \|v\| \cdot \sin \theta$

$\langle 1, -2, 4 \rangle$

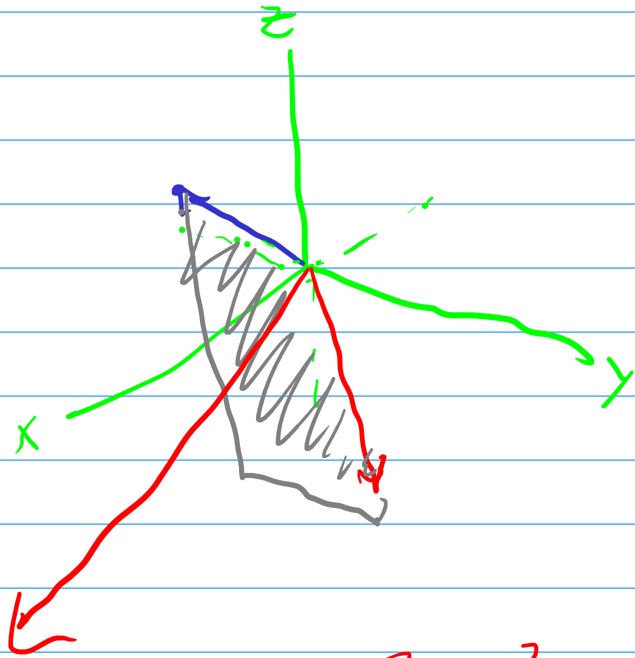
$\langle 3, 5, -7 \rangle$



$-14\hat{i} + 12\hat{j} + 5\hat{k} - (-6\hat{k} + 20\hat{i} + 7\hat{j})$

$-34\hat{i} + 5\hat{j} + 11\hat{k}$

$\langle -34, 5, 11 \rangle$



$(\vec{u} + \vec{v}) \times \vec{w} = \vec{u} \times \vec{w} + \vec{v} \times \vec{w}$

$\vec{w} \times (\vec{u} + \vec{v}) = \vec{w} \times \vec{u} + \vec{w} \times \vec{v}$

$\mathbb{R}^2$: x & y

$\mathbb{R}^3$: x & y & z

$\vec{p} = \langle 3, 1, 4 \rangle$ $\qquad$ $\vec{l}(t) = \vec{p} + t\vec{d}$

$\vec{d} = \langle 2, 1, 2 \rangle$

$\langle 3+2t, 1+t, 4+2t \rangle$

$$\frac{x-3}{2} = \frac{y-1}{1} = \frac{z-4}{2}$$