$\int x\sqrt{ax^2+b}dx$

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 Let $u = ?$

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$$x dx = -\frac{1}{8} du.$$

Find
$$\int \frac{x}{\sqrt{3-4x^2}} \mathrm{d}x.$$
 Let $u=3-4x^2$. Then $\mathrm{d}u=-8x\mathrm{d}x$
$$x\mathrm{d}x=-\frac{1}{8}\mathrm{d}u.$$
 Substitute:
$$\int \frac{x}{\sqrt{3-4x^2}} \mathrm{d}x=\int \frac{1}{\sqrt{u}}$$

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 Let $u=3-4x^2.$ Then $du=-8xdx$
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 Substitute:
$$\int \frac{x}{\sqrt{3-4x^2}} dx = \int \left(-\frac{1}{8}\right) \frac{1}{\sqrt{u}} du$$

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$$\int \frac{x}{\sqrt{3-4x^2}} dx.$$
Let $u = 3 - 4x^2$.
Then $du = -8x dx$

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$$= -\frac{1}{4}\sqrt{3-4x^2} + C.$$

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Let $u=3-4x^2$.
Then $du=-8xdx$

$$xdx=-\frac{1}{8}du.$$
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$$=-\frac{1}{4} \sqrt{3-4x^2} + C.$$