Problem:

$$\int \frac{x \arcsin(x)}{\sqrt{1-x^2}} \, \mathrm{d}x$$

Integrate by parts: $\int \mathrm{f}\mathrm{g}' = \mathrm{f}\mathrm{g} - \int \mathrm{f}'\mathrm{g}$

$$\mathrm{f} = \arcsin(x), \ \mathrm{g}' = \frac{x}{\sqrt{1-x^2}}$$

↓ steps ↓ steps

$$\mathrm{f}' = \frac{1}{\sqrt{1-x^2}}, \ \mathrm{g} = -\sqrt{1-x^2}:$$

$$= -\sqrt{1-x^2} \arcsin(x) - \int -1 \, \mathrm{d}x$$

Now solving:

$$\int -1 \, \mathrm{d}x$$

Apply linearity:

$$= -\int 1 \, \mathrm{d}x$$

Now solving:

$$\int 1 \, \mathrm{d}x$$

Apply constant rule:

$$= x$$

Plug in solved integrals:

$$-\int 1 \, \mathrm{d}x$$

$$= -x$$

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Plug in solved integrals:

$$-\sqrt{1-x^2}\arcsin(x) - \int -1\,\mathrm{d}x$$
$$= x - \sqrt{1-x^2}\arcsin(x)$$

The problem is solved:

$$\int \frac{x\arcsin(x)}{\sqrt{1-x^2}}\,\mathrm{d}x$$
$$= x - \sqrt{1-x^2}\arcsin(x) + C$$

ANTIDERIVATIVE COMPUTED BY MAXIMA:

$$\int \boldsymbol{f(x)\,\mathrm{d}x = F(x) =}$$

$$x - \sqrt{1-x^2}\arcsin(x) + C$$

Simplify

DEFINITE INTEGRAL:

$$\int_0^{\frac{1}{2}} \boldsymbol{f(x)\,\mathrm{d}x =}$$

$$-\frac{\sqrt{3}\pi - 6}{12}$$

Approximation:

$$0.0465501589414554$$

Simplify

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