

Find the general indefinite integral:

$$\int (2 + \tan^2 \theta) d\theta$$

reset

# Bellwork 1/12 - Solution

$$\begin{aligned}\int_0^4 (4 - t)\sqrt{t}dt &= 4 \int_0^4 \sqrt{t}dt - \int_0^4 t^{\frac{3}{2}}dt \\&= \frac{8}{3} \left[ t^{\frac{3}{2}} \right]_0^4 - \frac{2}{5} \left[ t^{\frac{5}{2}} \right]_0^4 \\&= \frac{8}{3} \left( 4^{\frac{3}{2}} \right) - \frac{2}{5} \left( 4^{\frac{5}{2}} \right) \\&= \boxed{\frac{128}{15}}\end{aligned}$$

# Exercise 1

Find the general indefinite integral:

$$\int \sqrt[4]{x^5} dx$$

# Exercise 1 - Solution

$$\begin{aligned}\int \sqrt[4]{x^5} dx &= \int x^{\frac{5}{4}} dx \\ &= \boxed{\frac{4}{9} x^{\frac{9}{4}} + C} \quad (\text{Power Rule})\end{aligned}$$

## Exercise 2

Find the general indefinite integral:

$$\int \left( \frac{1+r}{r} \right)^2 dr$$

## Exercise 2 - Solution

$$\begin{aligned}\int \left( \frac{1+r}{r} \right)^2 dr &= \int \frac{(1+r)^2}{r^2} dr \\&= \int \frac{r^2 + 2r + 1}{r^2} dr \\&= \int 1 + \frac{2}{r} + r^{-2} dr \\&= \boxed{r + 2 \ln |r| - r^{-1} + C}\end{aligned}$$