

Quiz 4

Name: _____ **Solutions** _____

Find the following antiderivatives:

$$1. \int (z^3 - 4z^2 - 7z + 2) dz = \frac{z^4}{4} - \frac{4}{3}z^3 - \frac{7}{2}z^2 + 2z + C$$

$$2. \int \sqrt{y} dy = \int y^{\frac{1}{2}} dy = \frac{2}{3}y^{\frac{3}{2}} + C$$

$$3. \int \sin(3\theta) d\theta = -\frac{1}{3}\cos(3\theta) + C$$

$$4. \int 2 \cos(t/3) dt = 6 \sin(t/3) + C$$

$$5. \int \frac{dx}{1+x^2} = \arctan(x) + C$$

$$6. \int e^{-x/7} dx = -7e^{-x/7} + C$$

$$7. \int \frac{dp}{\sqrt{1-p^2}} = \arcsin(p) + C$$

$$8. \int \frac{d\alpha}{\alpha} = \ln|\alpha| + C$$

$$\begin{aligned} 9. \int \frac{x^3 - 2x^2 + 1}{\sqrt{x}} dx &= \int \frac{x^3 - 2x^2 + 1}{x^{1/2}} dx = \int \left(x^{\frac{5}{2}} - 2x^{\frac{3}{2}} + x^{-\frac{1}{2}} \right) dx \\ &= \frac{2}{7}x^{\frac{7}{2}} - 2 \cdot \frac{2}{5}x^{\frac{5}{2}} + \frac{2}{3}x^{\frac{3}{2}} + C = \frac{2}{7}x^{\frac{7}{2}} - \frac{4}{5}x^{\frac{5}{2}} + \frac{2}{3}x^{\frac{3}{2}} + C \end{aligned}$$

$$10. \int \sqrt{3-9v} dv = \int (3-9v)^{\frac{1}{2}} dv = 2 \cdot \frac{1}{-9}(3-9v)^{\frac{3}{2}} + C = -\frac{2}{9}(3-9v)^{\frac{3}{2}} + C$$