

- Please see the course webpage for the answer key.

Compute each of the following Integrals.

1. $\int x \arcsin x \, dx$

2. Show that $\int_0^{\frac{\pi}{2}} \frac{\cos x}{(\sin^2 x + 1)^{\frac{7}{2}}} \, dx = \boxed{\frac{43}{60\sqrt{2}}}$

3. $\int \frac{x^2}{\sqrt{4-x^2}} \, dx$

4. $\int x^5 \sqrt{1-x^2} \, dx$ using Trigonometric Substitution

5. Show that $\int_{-3}^3 \sqrt{9-x^2} \, dx = \boxed{\frac{9\pi}{2}}$

6. $\int x^4 \arcsin x \, dx$

7. $\int \frac{1}{x(9+(\ln x)^2)} \, dx$

8. $\int \frac{1}{x(9+(\ln x)^2)^{\frac{5}{2}}} \, dx$

9. $\int \frac{1}{(x^2+4)^2} \, dx$

10. $\int \frac{x}{(4+x^2)^{\frac{7}{2}}} \, dx$ using Trigonometric Substitution Hint: $\tan \theta = \frac{\sin \theta}{\cos \theta}$