

Integrals**Advanced****Trig Substitution**

1. $\int \sqrt{4 + x^2} dx$

2. $\int \sqrt{1 + 4x^2} dx$

3. $\int \sqrt{1 + x^2} dx$

4. $\int \sqrt{25 + x^2} dx$

5. $\int \sqrt{x^2 + 9} dx$

6. $\int \sqrt{x^2 + 4} dx$

7. $\int \sqrt{x^2 + 2} dx$

8. $\int \sqrt{49 + x^2} dx$

9. $\int \sqrt{9 + 4x^2} dx$

10. $\int \sqrt{1 + 16x^2} dx$

Answers

Integrals

Advanced

Trig Substitution

$$1. 4 \left(\frac{1}{8x} \sqrt{4+x^2} + \frac{1}{2} \ln \left(\frac{|x + \sqrt{4+x^2}|}{2} \right) \right) + C$$

$$2. \frac{1}{4} \left(2x \sqrt{4x^2+1} + \ln |2x + \sqrt{1+4x^2}| \right) + C$$

$$3. \frac{1}{2} x \sqrt{1+x^2} + \frac{1}{2} \ln |x + \sqrt{1+x^2}| + C$$

$$4. 25 \left(\frac{1}{50x} \sqrt{25+x^2} + \frac{1}{2} \ln \left(\frac{|x + \sqrt{25+x^2}|}{5} \right) \right) + C$$

$$5. 9 \left(\frac{1}{18x} \sqrt{9+x^2} + \frac{1}{2} \ln \left(\frac{|x + \sqrt{9+x^2}|}{3} \right) \right) + C$$

$$6. 4 \left(\frac{1}{8x} \sqrt{4+x^2} + \frac{1}{2} \ln \left(\frac{|x + \sqrt{4+x^2}|}{2} \right) \right) + C$$

$$7. \frac{1}{2} x \sqrt{x^2+2} + \ln \left| \frac{1}{\sqrt{2}} x + \sqrt{\frac{1}{2}(2+x^2)} \right| + C$$

$$8. 49 \left(\frac{1}{98x} \sqrt{49+x^2} + \frac{1}{2} \ln \left(\frac{|x + \sqrt{49+x^2}|}{7} \right) \right) + C$$

$$9. \frac{1}{4} \left(2x\sqrt{4x^2 + 9} + 9 \ln \left(\frac{|2x + \sqrt{4x^2 + 9}|}{3} \right) \right) + C$$

$$10. \frac{1}{8} \left(4x\sqrt{16x^2 + 1} + \ln \left| 4x + \sqrt{1 + 16x^2} \right| \right) + C$$