Math 122
Quiz 3 Review

1. $\displaystyle\int \frac{x^3}{\sqrt{1-x^2}}\,dx$

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

3. $\displaystyle\int \frac{1}{(16-x^2)^{3/2}}\,dx$

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

5. $\displaystyle\int \tanh x\,dx$

6. $\displaystyle\int \frac{\cosh x}{3\sinh x+4}\,dx$

7. $\displaystyle\int \operatorname{arctanh}\,x\,dx$

8. $\displaystyle\int \frac{2-x}{x^2+x}\,dx$

9. $\displaystyle\int \frac{3x+11}{x^2+5x+6}\,dx$

10. $\displaystyle\int \frac{x^3+6x^2+3x+6}{x^3+2x^2}\,dx$

11. $\displaystyle\int \frac{2x^2+5x-1}{x^3+x^2-2x}\,dx$

12. $\displaystyle\int \frac{3x+6}{x^3+2x^2-3x}\,dx$

13. $\displaystyle\int \frac{6x^2-10x+2}{x^3-3x^2+2x}\,dx$

14. $\displaystyle\int \frac{x^2-3}{x^3+x}\,dx$

15. $\displaystyle\int \frac{3x^2-6x+9}{(x^2+9)(x-3)}\,dx$

Answers

1. $\frac{1}{2}\left[\frac{2}{3}(1-x^2)^{3/2} - 2(1-x^2)^{1/2}\right] + C$

2. $\ln|x + \sqrt{x^2+4}| + C$

3. $\frac{x}{16\sqrt{16-x^2}} + C$

4. $\frac{1}{2}\ln|\sqrt{4x^2+9} + 2x| + C$

5. $\ln\cosh x + C$

6. $\frac{1}{3}\ln|3\sinh x + 4| + C$

7. $x \operatorname{arctanh} x + \frac{1}{2}\ln|1-x^2| + C$

8. $2\ln|x| - 3\ln|x+1| + C$

9. $5\ln|x+2| - 2\ln|x+3| + C$

10. $x - \frac{3}{x} + 4\ln|x+2| + C$

11. $\frac{1}{2}\ln|x| + 2\ln|x-1| - \frac{1}{2}\ln|x+2| + C$

12. $-2\ln|x| + \frac{9}{4}\ln|x-1| - \frac{1}{4}\ln|x+3| + C$

13. $\ln|x| + 2\ln|x-1| + 3\ln|x-2| + C$

14. $-3\ln|x| + 2\ln|x^2+1| + C$

15. $\ln|x^2+9| + \ln|x-3| + C$