Тестовые задания
по теме «Неопределённый интеграл»

1. $\int (\boldsymbol{2x+1})^{\boldsymbol{2}}\boldsymbol{dx} =$

a) $4x^3 + 2x^2 + x + C;$
b) $\frac{4}{3}x^3 + 2x^2 + x + C;$
c) $\frac{4}{3}x^3 - 2x^2 + x + C;$
d) $\frac{4}{3}x^4 + 2x^2 + lnx + C;$
e) $\frac{4}{3}x^3 + 3x^2 + x + C.$

2. $\int \frac{\boldsymbol{x^2-1}}{\boldsymbol{x}}\boldsymbol{dx} =$

a) $\frac{x^2}{2} - \ln\ x + C$
b) $\frac{x^2}{2} - x + C;$
c) $\frac{x^2}{2} - ln|x| + C;$
d) $\frac{x^2}{2} - \sqrt{ln|x|} + C;$
e) $\frac{x^2}{2} - ln|x-1| + C.$

3. $\int \left(\boldsymbol{1 - \frac{1}{x^2}}\right)\sqrt{\boldsymbol{x}}\,\boldsymbol{dx}$

a) $\frac{4}{7}x^{\frac{4}{7}} + 4x^{\frac{1}{4}} + C;$
b) $\frac{4}{7}x^{\frac{7}{4}} + x^{-\frac{1}{4}} + C;$
c) $\frac{4}{7}x^{\frac{7}{4}} + 4x^{-\frac{1}{4}} + x + C;$
d) $\frac{4}{7}x^{\frac{7}{4}} + 4x^{-\frac{1}{4}} + C;$
e) $\frac{4}{7}x^{\frac{7}{4}} + 7x^{-\frac{1}{4}} + C.$

4. $\int \frac{\boldsymbol{2x-3\sqrt{x}+3\sqrt[4]{x^3}}}{\boldsymbol{x}}\boldsymbol{dx} =$

a) $2x - 6\sqrt{x} + 4\sqrt[4]{x^5} + C;$
b) $2x + 6\sqrt{x} + 4\sqrt[4]{x^3} + C;$
c) $2x^2 - 6\sqrt{x} + 4\sqrt[4]{x^3} + C;$
d) $2x - 6\sqrt{x} + 4\sqrt[3]{x^4} + C;$
e) $2x - 6\sqrt{x} + 4\sqrt[4]{x^3} + C.$

5. $\int \boldsymbol{sin^2\frac{x}{2}}\boldsymbol{dx} =$

a) $sin^3\frac{x}{2} + C;$
b) $\frac{1}{2}sin^3x + C;$
c) $\frac{1}{2}(x - sinx) + C;$
d) $\frac{1}{2}(x + sinx) + C;$
e) $\frac{1}{2}(x - cosx) + C.$

6. $\int \left(\boldsymbol{sin}\frac{\boldsymbol{x}}{\boldsymbol{2}}+\boldsymbol{cos}\frac{\boldsymbol{x}}{\boldsymbol{2}}\right)^{\boldsymbol{2}}\boldsymbol{dx}=$

a) $sinx-cosx+C;$
b) $sin+cosx+C;$
c) $x-cosx+C;$
d) $x+cosx+C;$
e) $x-sinx+C.$

7. $\int \boldsymbol{sin}\frac{\boldsymbol{x}}{\boldsymbol{2}}\boldsymbol{cos}\frac{\boldsymbol{x}}{\boldsymbol{2}}\boldsymbol{dx}=$

a) $\frac{1}{2}cosx+C;$
b) $-\frac{1}{2}cosxsinx+C;$
c) $-\frac{1}{2}cosx+C;$
d) $-cosx+C;$
e) $-\frac{1}{2}sinx+C;$

8. $\int \boldsymbol{e^x}\left(\boldsymbol{3}+\frac{\boldsymbol{e^{-x}}}{\boldsymbol{cos^2x}}\right)\boldsymbol{dx}=$

a) $3e^x+tgx+C;$
b) $e^x+tgx+C;$
c) $3e^x+tgx+e^{-x}+C;$
d) $3e^x+ctgx+C;$
e) $3e^x+3tgx+C.$

9. $\int \boldsymbol{4^x}\left(\boldsymbol{3}+\frac{\boldsymbol{4^{-x}}}{\boldsymbol{\sqrt[3]{x^2}}}\right)\boldsymbol{dx}=$

a) $\frac{4^x}{ln4}+\sqrt[3]{x}+C;$
b) $\frac{3*4^x}{ln4}-3\sqrt[3]{x}+C;$
c) $\frac{3*4^x}{4}+3\sqrt[3]{x}+C;$
d) $\frac{3*4^x}{ln4}+3\sqrt[3]{x}+C;$
e) $\frac{3x}{ln4}+3\sqrt[3]{2x}+C;$

10. $\int \frac{\boldsymbol{2^x+5^x}}{\boldsymbol{10^x}}\boldsymbol{dx}=$

a) $5^xln5+2^xln2+C;$
b) $-\frac{5^x}{ln5}+\frac{2^x}{ln2}+C;$
c) $-\frac{1}{5^xln5}-\frac{1}{2^xln2}+C;$
d) $-\frac{1}{5^xln5}+\frac{1}{2^xln2}+C;$
e) $-5^xln5-2^xln2+C.$

11. $\int\left(\boldsymbol{2^{x+1}-5^{x-1}}\right)\boldsymbol{dx}=$

a) $\frac{2^{x+1}}{ln2}-\frac{5^{x-1}}{ln5}+C;$

b) $\frac{2^x}{ln2} - \frac{5^x}{ln5} + C;$
c) $\frac{2^{x+1}}{2} - \frac{5^{x-1}}{5} + C;$
d) $\frac{2^{x+1}}{ln2} + \frac{5^{x-1}}{ln5} + C;$
e) $\frac{2^{x-1}}{ln2} - \frac{5^{x-1}}{ln5} + C.$

12. $\int (\mathbf{2^x + 3^x})^2 \boldsymbol{dx} =$

a) $\frac{4^{x+1}}{ln2} + \frac{2*6^{x-1}}{ln2} + \frac{9^x}{ln9} + C;$

b) $\frac{4^{x+1}}{ln4} + \frac{2*6^{x-1}}{ln6} + \frac{9^x}{ln9} + C;$

c) $\frac{4^x}{ln4} + \frac{2*6^x}{ln6} + \frac{9^x}{ln9} + C;$

d) $\frac{4^x}{ln2} + \frac{6^x}{ln2} + \frac{9^x}{ln9} + C;$

e) $\frac{4^{x+1}}{2} + \frac{2*6^{x-1}}{2} + \frac{9^x}{9} + C.$

13. $\int \frac{\boldsymbol{dx}}{\mathbf{4+x^2}} =$

a) $\frac{1}{2} arctg \frac{x}{4} + C;$
b) $\frac{1}{2} arcos \frac{x}{2} + C;$
c) $2arctg \frac{x}{2} + C;$
d) $\frac{1}{2} arctgx + C;$
e) $\frac{1}{2} arctg \frac{x}{2} + C.$

14. $\int \frac{\boldsymbol{dx}}{\sqrt{\mathbf{8-x^2}}} =$

a) $arcsin \frac{x\sqrt{2}}{2} + C;$
b) $arcsin \frac{x\sqrt{2}}{4} + C;$
c) $2arcsin \frac{x\sqrt{2}}{2} + C;$
d) $arccos \frac{x\sqrt{2}}{4} + C;$
e) $\frac{1}{4} arcsin \frac{x\sqrt{2}}{2} + C.$

15. $\int \frac{\mathbf{tg^2x-4}}{\mathbf{sin^2x}} \boldsymbol{dx} =$

a) $tg2x + 4ctgx + C;$
b) $ctgx + 4tgx + C;$
c) $tg^2x + 4ctg^2x + C;$
d) $tgx + 4ctgx + C;$
e) $tgx - 4ctgx + C.$

16. $\int \frac{\mathbf{x^2+2}}{\mathbf{x^2-1}} \boldsymbol{dx} =$

a) $\frac{3}{2} ln \left|\frac{x-1}{x+1}\right| + C;$

b) $x - \frac{3}{2} ln \left|\frac{x-1}{x+1}\right| + C;$

c) $x + \frac{2}{3} ln \left|\frac{x-1}{x+1}\right| + C;$

d) $x + \frac{3}{2} ln \left|\frac{x-1}{x+2}\right| + C;$

e) $x + \frac{3}{2} ln \left|\frac{x-1}{x+1}\right| + C.$

17. $\int \frac{3x^4+3x^2+1}{x^2+1} dx =$

a) $3x^2 + arctgx + C;$

b) $x^3 + arcctgx + C;$

c) $x^3 + arctgx + C;$

d) $3x + arctgx + C;$

e) $x^3 + arccosx + C;$

18. $\int \frac{-2x^4+4x^2-1}{1-x^2} dx =$

a) $\frac{2}{3}x^3 - x - \frac{1}{2} ln \left|\frac{x-1}{x+1}\right| + C;$

b) $\frac{2}{3}x^3 + 2x - \frac{1}{2} ln \left|\frac{x-1}{x+1}\right| + C;$

c) $\frac{2}{3}x^3 - 2x - \frac{1}{2} ln \left|\frac{x-1}{x+1}\right| + C;$

d) $\frac{2}{3}x^3 - 2x - \frac{1}{2} ln \left|\frac{x-2}{x+2}\right| + C;$

e) $\frac{2}{3}x^2 - 2x - \frac{1}{2} ln \left|\frac{x-1}{x+1}\right| + C.$

19. $\int \frac{dx}{16-x^2} =$

a) $\frac{1}{2} ln \left|\frac{x+4}{x-4}\right| + C;$

b) $\frac{1}{8} arcsin \frac{x}{4} + C;$

c) $\frac{1}{8} ln \left|\frac{x+4}{x-4}\right| + C;$

d) $\frac{1}{4} \arcsin x + C;$

e) $\frac{1}{8} ln \left|\frac{x+4}{x-4}\right| + C.$

20. $\int \left(\frac{2-x}{x}\right)^3 dx =$

a) $x + \frac{4}{x^2} + \frac{12}{x} + 6ln|x| + C;$

b) $-x - \frac{4}{x^2} + \frac{12}{x} + 6ln|x| + C;$

c) $-x - \frac{2}{x^2} + \frac{12}{x} + ln|x| + C;$

d) $-x - \frac{4}{x^2} + \frac{12}{x} - ln|x| + C;$

e) $-x - \frac{4}{x^2} + \frac{12}{x^3} + 6ln|x| + C.$