



## The New English Private School

Tel. NEPS 1: 011 320 57 20 NEPS 2:011 836 20 32 NEPS 3: 011-868-59-15 NEPS 4: 011-836-01-55

www.NEPschool.edu.et P.O.Box 18609 Addis Ababa Ethiopia

Name \_\_\_\_\_ 3<sup>rd</sup> Quarter Date: 23/03/2020 Subject: Mathematics  
Review worksheet 3 Grade: 12 Teacher's Name: Mr. Abrha

### CHOOSE THE CORRECT ANSWER FROM THE GIVEN ALTERNATIVES.

- Which of the following is an anti-derivative of  $f(x) = \frac{2x+3}{2x^2+x}$   
A.  $\ln|x| + \ln|2x + 1|$  C.  $\ln\left|\frac{2x+1}{x}\right|$   
B.  $3\ln|x| - 2\ln|2x + 1|$  D.  $\ln\left|\frac{x}{2x+1}\right|$
- Which of the following is equal to  $\int \frac{e^{\sqrt{x}}}{\sqrt{x}} dx$ ?  
A.  $e^{\sqrt{x}} + c$  B.  $\frac{1}{2}e^{\sqrt{x}} + c$  C.  $2e^{\sqrt{x}} + c$  D.  $2e^x + c$
- Which of the following statements is true?  
A.  $\int \tan x dx = \ln|\cos x| + c$  C.  $\int \sec x \tan x dx = \tan x + c$   
B.  $\int \csc^2 x dx = \cot x + c$  D.  $\int \cot x dx = \ln|\sin x| + c$
- $\int \frac{\cos 2x}{\cos x - \sin x} dx$  is equal to  
A.  $\sin x + \cos x + c$  C. impossible to integrate  
B.  $\sin x - \cos x + c$  D. none
- $\int \sin^2 x dx$  is equal to  
A.  $\frac{\sin^3 x}{3} + \sin x + c$  B.  $\frac{\sin^3 x}{3} + c$  C.  $\frac{x}{2} + \frac{1}{4} \sin 2x + c$  D.  $\frac{1}{2} (x - \frac{1}{2} \sin 2x) + c$
- $\int \frac{e^{2x}-4x}{xe^{2x}} dx$  is equal to  
A.  $\ln|x| + 4e^{-2x} + c$  C.  $\ln|x| - 4e^{2x} + c$   
B.  $\ln|x| + 2e^{-2x} + c$  D.  $\frac{-1}{x^2} + 2e^{-2x} + c$

7.  $\int \frac{4x}{(x^2+1)^2} dx$  is equal to
- A.  $\frac{-2}{x^2+1} + c$       B.  $\frac{1}{(x^2+1)^3}$       C.  $\frac{-x}{x^2+1}$       D.  $\frac{2}{x^2+1}$
8. Which of the following is an antiderivative of  $f(x) = \frac{x+1}{x-x^2}$
- A.  $\ln|1-x| + \ln|x|$       C.  $\ln|x| + 2\ln|1-x|$   
 B.  $\ln|x| - 2\ln|1-x|$       D.  $\ln|x| + 2\ln|1+x|$
9. Which of the following is equal to  $\int xe^{4x} dx$
- A.  $e^{4x} \left(x - \frac{1}{4}\right) + c$       B.  $\frac{1}{4} e^{4x} \left(x - \frac{1}{4}\right) + c$       C.  $4e^{4x} \left(x - 4\right) + c$       D.  $4e^{4x} \left(x - \frac{1}{4}\right) + c$
10. The value of  $\int_0^1 (1+x)e^x dx$  is
- A. 0      B. 1      C. e      D.  $\frac{e-1}{e^2}$
11. What is the area of the region bounded between the graph of  $f(x) = x^2$  and  $g(x) = \sqrt{x}$ ?
- A. 3 sq units      B.  $\frac{2}{3}$  sq units      C.  $\frac{1}{3}$  sq units      D. 1 sq. units
12. What is the area of the region enclosed by the graph of  $y = x^3 + x$  and  $y = 5x$  in sq.u?
- A. 16      B. 8      C. 4      D. none
13. If  $f'(x) = x^2 + 8x + 3$  and  $f(-3) = 32$ , then what is the formula for  $f(x)$ ?
- A.  $x^2 + 4x^2 + 3x + 2$       B.  $\frac{x^3}{3} + 8x^2 + 3x$       C.  $\frac{x^3}{3} + 4x^2 + 3x + 4$       D.  $x^2 + 4x + 3$
14.  $\int \sin^3 x dx$  is equal to
- A.  $\frac{\sin^3 x}{3} + \sin x + c$       B.  $\frac{\cos^3 x}{3} - \cos x + c$       C.  $\frac{\sin^4 x}{4} + c$       D.  $\frac{\cos^4 x}{4} + c$
15.  $\int \frac{\cos 2x}{\cos x + \sin x} dx$  is equal to
- A.  $\sin x + \cos x + c$       C.  $\sin x - \cos x + c$   
 B. *impossible to integrate*      D.  $\sin^2 x + \cos x + c$
16.  $\int \frac{e^{2x}}{e^x + 1} dx$  is equal to
- A.  $e^x + c$       B.  $e^x - \ln(e^x + 1) + c$       C.  $\ln \left| \frac{e^x + 1}{x} \right| + c$       D.  $\ln(e^x + 1) - e^x + c$
17.  $\int \frac{e^{2x} + 3x}{xe^{2x}} dx$  is equal, to
- A.  $\ln|x| + \frac{3e^{-2x}}{2} + c$       B.  $\ln|x| - \frac{3e^{-2x}}{2} + c$       C.  $\ln|x| + 3e^{-2x} + c$       D.  $-1/x^2 + 2e^{-2x} + c$

18. If  $f'$  is continuous on  $[0,1]$  such that  $f(0)=3$  and  $f(1)=-1$ , Then what is the value of  $\int_0^1 f'(x)\sqrt{1+f(x)} dx$
- A. -12                      B. 14/3                      C. -16/3                      D.  $\frac{2}{3}(2\sqrt{2}-1)$
19.  $\int \frac{6x}{(x^2+1)^2} dx$  is equal to
- A.  $\frac{-1}{(x^2+1)^3}$                       B.  $\frac{-x}{(x^2+1)}$                       C.  $\frac{3}{(x^2+1)}$                       D.  $\frac{-3}{(x^2+1)}$
20. The volume of the solid which is generated when the region bounded by  $y=\sqrt{x+1}$  and the x- axis from  $x=0$  to  $x=2$  is rotated about the x-axis is equal to:
- A.  $4\pi$                       B.  $3\pi$                       C.  $\frac{4}{3}\pi$                       D.  $\frac{3}{4}\pi$
21. An antiderivative of  $f(x) = \frac{1}{\sqrt{x+1}} + e^{3x}$  is
- A.  $\frac{1}{2}\sqrt{x+1} + 3e^{3x}$                       C.  $2\sqrt{x+1} + e^{3x}/3$   
 B.  $\frac{1}{2}\sqrt{x+1} + e^{3x}/3$                       D.  $\sqrt{x+1} + 3e^{3x}$
22.  $\int (1 + \sin^2 x) \cot x dx$  is equal to
- A.  $\csc x - \sec^2 x + c$                       C.  $\ln|\sin x| - \cos^2 x + c$   
 B.  $\ln|\sin x| + \frac{1}{2} \sin^2 x + c$                       D.  $2\csc x + \sin x \cos x + c$
23.  $\int \frac{dx}{x(2+\ln x)}$  is equal to
- A.  $\ln|\ln x| + c$       B.  $\ln|2 + \ln x| + c$       C.  $x \ln|2 + \ln x| + c$       D.  $(2 + \ln x) + c$
24.  $\int x^3 \ln x dx$  is equal to
- A.  $\frac{1}{3}x^3(\ln x - \frac{1}{3}) + c$       B.  $4x^4(\ln x + 4) + c$       C.  $\frac{1}{4}x^4(\ln x - \frac{1}{4}) + c$       D.  $x^4(\ln x - 1) + c$
25. The area of the region bounded by  $f(x) = \frac{x}{x+1}$  and the x-axis between  $x = -\frac{1}{2}$  and  $x = 3$  is:
- A.  $\frac{7}{2} - 3\ln 2$                       B.  $\frac{7}{2} - \ln 2$                       C.  $\frac{7}{2} + 3\ln 2$                       D.  $\frac{7}{2} + \ln 2$
26. What is the area of the region b/n the graphs of the functions  $y = x^2$  and  $y = 2 - x$ , where  $0 \leq x \leq 2$ ?
- A.  $\frac{3}{2}$  sq.unit                      B. 2 sq.unit                      C.  $\frac{2}{3}$  sq.unit                      D. 3 sq.unit

27. What is the volume of a solid revolution obtained by revolving the region enclosed by the graphs of the functions  $y = x^2 + 2$  and  $y = 3x$  about the x-axis in cubic units?
- A.  $\frac{22}{15}\pi$                       B.  $\frac{38}{15}\pi$                       C.  $\frac{86}{15}\pi$                       D.  $\frac{16}{15}\pi$
28. The volume of the solid which is generated when the region enclosed by the graph of the function  $y = \sqrt{x+1}$  and the x-axis from  $x = 0$  to  $x = 2$  rotated about the x-axis in cubic units is equal to?
- A.  $\frac{4}{3}\pi$                       B.  $4\pi$                       C.  $3\pi$                       D.  $\frac{3}{4}\pi$
29. Which one of the following integral value is false?
- A.  $\int \sin^2 x dx = \frac{1}{2}x - \frac{1}{4}\sin(2x) + c$                       C.  $\int \tan^2 x dx = \tan x - x + c$
- B.  $\int \cos^2 x dx = \frac{1}{2}x + \frac{1}{4}\sin(2x) + c$                       D.  $\int \ln x dx = \frac{1}{x} + c$
30.  $\int_0^1 \frac{2x+3}{x^2-x-2} dx$  is equal to:
- A.  $-\frac{3}{8}\ln 2$                       B.  $-\frac{8}{3}\ln 2$                       C.  $-\frac{3}{8}\ln 5$                       D.  $-\frac{3}{2}\ln 5$

Parent/Guardian's signature \_\_\_\_\_

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