

## Integration Review

Date \_\_\_\_\_ Period \_\_\_\_\_

Evaluate each indefinite integral. For some, u-substitution will make the problem much simpler.

1)  $\int 5x^4 \sqrt[3]{x^5 - 5} \, dx$

2)  $\int (x^3 + 3)^5 \cdot 3x^2 \, dx$

3)  $\int \frac{12x^2}{(x^3 - 5)^3} \, dx$

4)  $\int 16x^3 (2x^4 - 3)^{\frac{1}{2}} \, dx$

5)  $\int \frac{6\cos 2x}{\sin^3 2x} \, dx$

6)  $\int 4e^{2x} \cdot (e^{2x} - 3)^{\frac{2}{5}} \, dx$

Evaluate each indefinite integral.

$$7) \int -25 \cos 5x \cdot \cos(\sin 5x) dx$$

$$8) \int 12e^{3x} \cos(e^{3x} + 4) dx$$

$$9) \int -\frac{15x^2}{5x^3 + 2} dx$$

$$10) \int \frac{15e^{5x}}{e^{5x} - 3} dx$$

$$11) \int 15x^2 e^{x^3 + 4} dx$$

$$12) \int -\frac{10x^4}{x^5 + 5} dx$$

$$13) \int \frac{2}{x(1 + \ln 5x)} dx$$

$$14) \int -3 \sin x \cdot e^{\cos x} dx$$

$$15) \int \frac{1}{\sqrt{1-x^2}} dx$$

$$16) \int \frac{1}{1+x^2} dx$$

Evaluate each definite integral. If u-sub could be used, practice changing the boundaries of the definite integral to u-boundaries.

$$17) \int_1^5 (-x^2 + 6x - 11) dx$$

$$18) \int_{-1}^0 -e^x dx$$

$$19) \int_{-4}^{-1} (x^2 + 8x + 12) dx$$

$$20) \int_2^4 -\frac{1}{x} dx$$

$$21) \int_2^4 \frac{5}{x} dx$$

$$22) \int_{-3}^{-1} \frac{5}{x^2} dx$$

$$23) \int_3^4 (-x^3 + 4x^2 - 4) dx$$

$$24) \int_2^3 \frac{5}{x^3} dx$$

$$25) \int_{-3}^1 -3x^{\frac{1}{3}} dx$$

$$26) \int_2^3 -\frac{1}{x^3} dx$$

$$27) \int_{-4}^{-3} 2e^{2x+6} dx$$

$$28) \int_{-1}^2 2e^{2x-4} dx$$

$$29) \int_5^7 \frac{4}{(2x-6)^2} dx$$

$$30) \int_3^6 \frac{4}{x-1} dx$$

$$31) \int_{-3}^{-2} -3e^{x+2} dx$$

$$32) \int_{-4}^{-3} \frac{1}{2x+4} dx$$

## Answers to Integration Review (ID: 1)

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|---|---|--|--|
| 1) $\frac{3}{4}(x^5 - 5)^{\frac{4}{3}} + C$ | 2) $\frac{1}{6}(x^3 + 3)^6 + C$                 | 3) $-\frac{2}{(x^3 - 5)^2} + C$                  | 4) $\frac{4}{3}(2x^4 - 3)^{\frac{3}{2}} + C$ |
| 5) $-\frac{3}{2 \cdot \sin^2 2x} + C$       | 6) $\frac{10}{7}(e^{2x} - 3)^{\frac{7}{5}} + C$ | 7) $-5\sin(\sin 5x) + C$                         | 8) $4\sin(e^{3x} + 4) + C$                   |
| 9) $-\ln 5x^3 + 2  + C$                     | 10) $3\ln e^{5x} - 3  + C$                      | 11) $5e^{x^3 + 4} + C$                           | 12) $-2\ln x^5 + 5  + C$                     |
| 13) $2\ln 1 + \ln 5x  + C$                  | 14) $3e^{\cos x} + C$                           | 15) $\sin^{-1} x + C$                            |  |
| 16) $\tan^{-1} x + C$                       | 17) $-\frac{40}{3} \approx -13.333$             | 18) $\frac{-e + 1}{e} \approx -0.632$            | 19) $-3$                                     |
| 20) $-\ln 4 + \ln 2 \approx -0.693$         | 21) $5\ln 4 - 5\ln 2 \approx 3.466$             | 22) $\frac{10}{3} \approx 3.333$                 |  |
| 23) $\frac{19}{12} \approx 1.583$           | 24) $\frac{25}{72} \approx 0.347$               | 25) $\frac{-9 + 27\sqrt[3]{3}}{4} \approx 7.485$ |  |
| 26) $-\frac{5}{72} \approx -0.069$          | 27) $\frac{e^2 - 1}{e^2} \approx 0.865$         | 28) $\frac{e^6 - 1}{e^6} \approx 0.998$          | 29) $\frac{1}{4} = 0.25$                     |
| 30) $4\ln 5 - 4\ln 2 \approx 3.665$         | 31) $\frac{-3e + 3}{e} \approx -1.896$          | 32) $\frac{\ln 2 - \ln 4}{2} \approx -0.347$     |  |