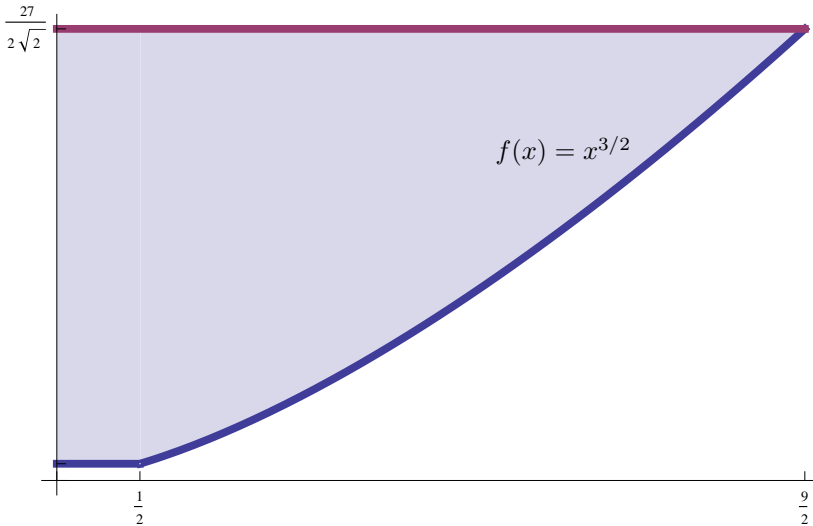


1. Find the limit if it exists:

$$\lim_{x \rightarrow \infty} (x^2) \left(\ln \left(3^{\frac{1}{x}} \right) \right)$$

- | | |
|--------------|------------------|
| A. -2 | C. 1 |
| B. $-\infty$ | D. ∞ |
| | E. none of these |

2. Select the integral that represents the shaded area below:



- A. $\frac{13}{2\sqrt{2}} + \int_{\frac{1}{2}}^{\frac{9}{2}} \left[\frac{27}{2\sqrt{2}} - x^{3/2} \right] dx$
- B. $\int_{\frac{1}{2}}^{\frac{9}{2}} y^{2/3} dy$
- C. $\int_{\frac{1}{2}}^0 x^{3/2} dy$
- D. $\int_0^{\frac{27}{2\sqrt{2}}} y^{2/3} dy$
- E. none of these

3. Find the indefinite integral:

$$\int \frac{16z + 3}{(8z^2 + 3z + 1)^{3/2}} dz$$

- A. $-\frac{2}{\sqrt{8z^2 + 3z + 1}} + c$

B.

$$\frac{512z^6}{3} + 192z^5 + 136z^4 + 57z^3 + 17z^2 + 3z + c$$

C.

$$\frac{5}{6} (8z^2 + 3z + 1)^{6/5} + c$$

D.

$$32z^4 + 24z^3 + \frac{25z^2}{2} + \sin(1) \sin(8z^2 + 3z) - \cos(1) \cos(8z^2 + 3z) + 3z + c$$

E. none of these

4. Find the indefinite integral:

$$\int \tan(3 - \theta) d\theta$$

A.

$$\ln(\cos(3 - \theta)) + c$$

B.

$$-\frac{1}{4}(3 - \theta)^4 + c$$

C.

$$\theta e^{[1]} + c$$

D.

$$-\ln(\sin(3 - \theta)) + c$$

E. none of these

5. Find the limit if it exists:

$$\lim_{x \rightarrow \infty} (x^{3+\pi}) - (e^{x^2})$$

A.

e

C.

$\frac{2}{3}$

B.

$-\infty$

D.

0

E. none of these

6. Find the indefinite integral:

$$\int \frac{8\alpha + 2}{4\alpha^2 + 2\alpha + 5} d\alpha$$

A.

$$\frac{3}{2} (4\alpha^2 + 2\alpha + 5)^{2/3} + c$$

B.

$$\ln(4\alpha^2 + 2\alpha + 5) + c$$

C.

$$\sin(5) \sin(4\alpha^2 + 2\alpha) - \cos(5) \cos(4\alpha^2 + 2\alpha) + c$$

D.

$$\sin(5) \cos(4\alpha^2 + 2\alpha) + \cos(5) \sin(4\alpha^2 + 2\alpha) + c$$

E. none of these

7. Find the limit if it exists:

$$\lim_{x \rightarrow \infty} (5x^2) (\pi^{-x})$$

A.

$$e$$

C.

$$0$$

B.

$$-\frac{14}{13}$$

D.

$$\infty$$

E. none of these

8. Select the indeterminate form:

A.

$$1^0$$

C.

$$\infty \cdot 0$$

B.

$$0^\infty$$

D.

$$\arctan(\infty)$$

E. none of these

9. Find the limit if it exists:

$$\lim_{x \rightarrow 1} \{e^x\}$$

A.

1

C.

e

B.

0

D.

$-\infty$

E. none of these

10. Find the limit if it exists:

$$\lim_{x \rightarrow \infty} \left(\frac{2+2x+8x^2+3x^3}{6+6x} \right)$$

A.

0

C.

$\left(\frac{13}{12} \right)$

B.

$\{\infty\}$

D.

∞

E. none of these

11. Find the indefinite integral:

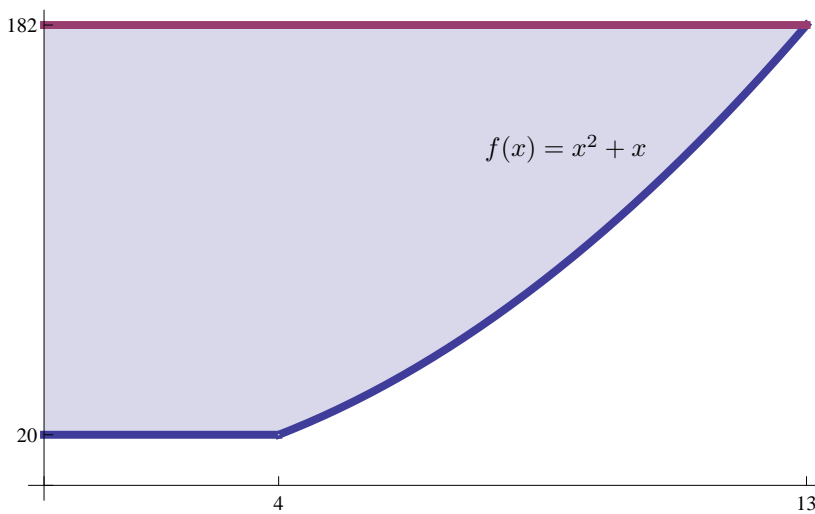
$$\int \frac{1}{w^2 + 1} dw$$

A.

$-\cos(w) + c$

- | | |
|---|--|
| <p>B. $\ln(w) + c$</p> <p>C. $\tan^{-1}(w) + c$</p> | <p>D. $e^w + c$</p> <p>E. none of these</p> |
|---|--|

12. Select the integral that represents the shaded area below:



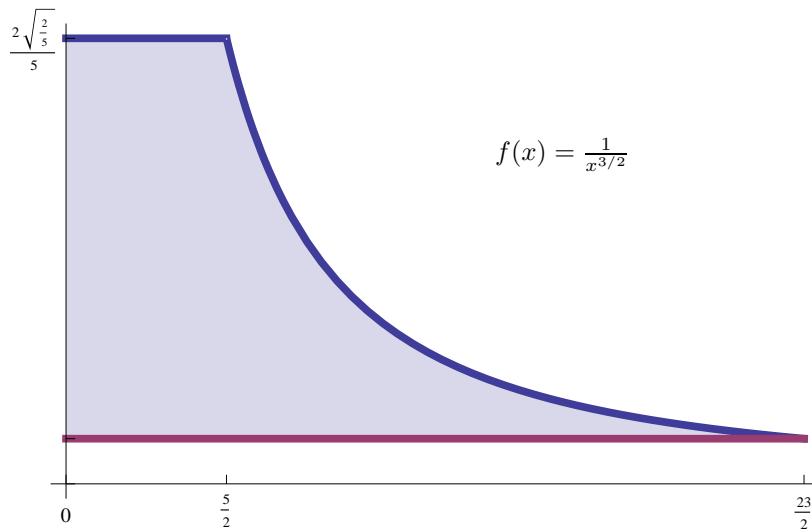
- A. $\int_4^{13} \frac{1}{2} (-\sqrt{4y+1} - 1) dy$
- B. $\int_0^{182} \frac{1}{2} (-\sqrt{4y+1} - 1) dy$
- C. $\int_4^0 x^2 + x dy$
- D. $648 + \int_4^{13} [182 - x^2 + x] dx$
- E. none of these

13. Find the limit if it exists:

$$\lim_{x \rightarrow \infty} (\ln(x)) - \left(\frac{1}{1 - \cos\left(\frac{1}{x}\right)} \right)$$

- | | |
|--|---|
| <p>A. 1</p> <p>B. $-\infty$</p> | <p>C. 5</p> <p>D. ∞</p> <p>E. none of these</p> |
|--|---|

14. Select the integral that represents the shaded area below:



- A. $\int_0^{\frac{\sqrt[5]{41}}{2^{2/5}}} \frac{1}{y^{2/3}} dy$
- B. $\frac{5}{2} \left(\frac{\sqrt[5]{41}}{2^{2/5}} - \frac{\sqrt[5]{5}}{2^{2/5}} \right) + \int_{\frac{5}{2}}^{\frac{23}{2}} \left[\frac{\sqrt[5]{41}}{2^{2/5}} - \frac{1}{x^{3/2}} \right] dx$
- C. $\int_{\frac{5}{2}}^0 \frac{1}{x^{3/2}} dy$
- D. $\int_{\frac{5}{2}}^{\frac{23}{2}} \frac{1}{y^{2/3}} dy$
- E. none of these

15. Find the indefinite integral:

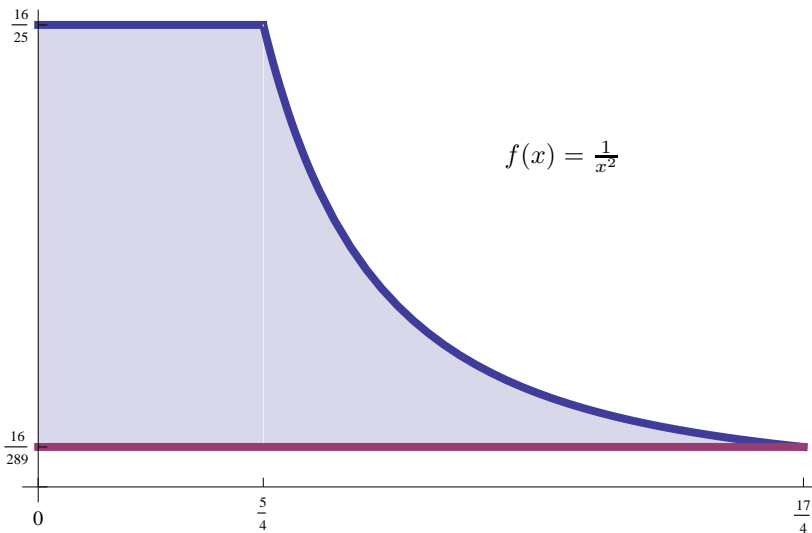
$$\int \cos(u) du$$

- A. $-\ln(\cos(u)) + c$
- B. $\ln(u) + c$
- C. $\ln\left(\sin\left(\frac{u}{2}\right)\right) - \ln\left(\cos\left(\frac{u}{2}\right)\right) + c$
- D. $\sin(u) + c$
- E. none of these



16.

Select the integral that represents the shaded area below:



- A. $\int_{\frac{5}{4}}^{\frac{17}{4}} -\frac{1}{\sqrt{y}} dy$
- B. $\int_0^{\frac{17}{4}} \frac{1}{x^2} dx$
- C. $\int_{\frac{49\sqrt{\frac{7}{5}}}{25}}^{\frac{1521\sqrt{\frac{39}{10}}}{100}} -\frac{1}{\sqrt{y}} dy$
- D. $\int_{\frac{5}{4}}^0 \frac{1}{x^2} dy$
- E. none of these

17. Find the limit if it exists:

$$\lim_{x \rightarrow 0^+} \left(\frac{x^3}{x^4} \right)$$

- A. $-\frac{8}{11}$
- B. 1
- C. $-\infty$
- D. ∞
- E. none of these

18. Find the indefinite integral:

$$\int (14z + 2) (7z^2 + 2z + 5)^2 dz$$

- A. $\sin(5) \cos(7z^2 + 2z) + \cos(5) \sin(7z^2 + 2z) + c$
- B. $\frac{3}{2} (7z^2 + 2z + 5)^{2/3} + c$

C.

$$\ln(7z^2 + 2z + 5) + c$$

D.

$$\frac{343z^6}{3} + 98z^5 + 273z^4 + \frac{428z^3}{3} + 195z^2 + 50z + c$$

E. none of these

19. Find the limit if it exists:

$$\lim_{x \rightarrow 0^+} \left(\frac{x^3}{x^{4/3}} \right)$$

A.

4

C.

∞

B.

$\frac{3}{5}$

D.

0

E. none of these

20. Find the derivative:

$$y = x^{x^x}$$

A.

$$\frac{dy}{dx} = x^{x^x} (x^{x-1} + x^x \ln(x)(\ln(x) + 1))$$

C.

$$\frac{dy}{dx} = \ln(x) + 1$$

B.

$$\frac{dy}{dx} = \frac{e^x}{x} + e^x \ln(x)$$

D.

$$\frac{dy}{dx} = \pi^\pi x^{\pi^\pi - 1}$$

E. none of these

q1 = 'D'; q2 = 'A'; q3 = 'E'; q4 = 'A'; q5 = 'B'; q6 = 'B'; q7 = 'C'; q8 = 'C'; q9 = 'C'; q10 = 'B'; q11 = 'C'; q12 = 'D'; q13 = 'B'; q14 = 'E'; q15 = 'D'; q16 = 'C'; q17 = 'D'; q18 = 'D'; q19 = 'D'; q20 = 'A';