Student: ____________________
Date: ____________________

Instructor: Robert Brown
Course: Calculus I Spring 2019 Math 1540 Dr. Bob Brown CRN 20506
Assignment: Calculus I Test 4 Practice 2

1. Express the sum in sigma notation.

$2+4+6+8+10$

- **A.** $\sum_{k=1}^{5} 2(k+1)$
- **B.** $\sum_{k=1}^{6} 2k$
- **C.** $\sum_{k=0}^{4} 2(k+1)$
- **D.** $\sum_{k=2}^{5} 2(k-1)$

ID: 5.2-13

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2. Use a finite approximation to estimate the area under the graph of the given function on the stated interval as instructed.

$f(x)=x^2$ between $x=3$ and $x=7$ using an upper sum with four rectangles of equal width.

- **A.** 117
- **B.** 126
- **C.** 105
- **D.** 86

ID: 5.1-6

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3. Write the sum without sigma notation and evaluate it.

$$\sum_{k=1}^{4} 2\cos\frac{\pi}{k}$$

- **A.** $2\cos\pi+2\cos\frac{\pi}{4}=-2+\sqrt{2}$
- **B.** $2\cos\pi+2\cos\frac{\pi}{2}+2\cos\frac{\pi}{3}+2\cos\frac{\pi}{4}=3+\sqrt{2}$
- **C.** $2\cos\pi+2\cos\frac{\pi}{2}+2\cos\frac{\pi}{3}+2\cos\frac{\pi}{4}=-2+\sqrt{3}+\sqrt{2}$
- **D.** $2\cos\pi+2\cos\frac{\pi}{2}+2\cos\frac{\pi}{3}+2\cos\frac{\pi}{4}=-1+\sqrt{2}$

ID: 5.2-4

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4. Suppose that $\int_{-6}^{-3} g(t)\,dt = 4$. Find $\int_{-6}^{-3} \frac{g(x)}{4}\,dx$ and $\int_{-3}^{-6} -g(t)\,dt$.

- **A.** 0; 4
- **B.** 1; -4
- **C.** 1; 4
- **D.** -1; -4

ID: 5.3-10

5. Suppose that g is continuous and that $\int_{1}^{5} g(x)\,dx = 6$ and $\int_{1}^{9} g(x)\,dx = 16$. Find $\int_{9}^{5} g(x)\,dx$.

- **A.** 10
- **B.** 22
- **C.** -10
- **D.** -22

ID: 5.3-14

6. Evaluate the integral $\int_{0}^{5/2} t^2\,dt$.

The value of the integral $\int_{0}^{5/2} t^2\,dt$ = ____________.

(Type a simplified fraction.)

ID: 5.3.35

7. Evaluate the integral.

$$\int_{0}^{4} \left(5x^2 - 8x + 6\right) dx$$

$\int_{0}^{4} \left(5x^2 - 8x + 6\right) dx$ = ____________

(Simplify your answer.)

ID: 5.4.2

8. Evaluate the integral.

$$\int_0^3 (x+2)^3\ dx$$

- A. 63
- B. 609
- C. $\frac{609}{4}$
- D. $\frac{625}{4}$

ID: 5.4-2

9. Evaluate the following integral.

$$\int_0^2 7x(x-7)dx$$

$\int_0^2 7x(x-7)dx =$ ____________ (Simplify your answer.)

ID: 5.4.1

10. Evaluate the definite integral $\int_{-5}^4 \frac{2}{(x-6)^4}dx$.

$\int_{-5}^4 \frac{2}{(x-6)^4}dx =$ ____________ (Simplify your answer.)

ID: 5.4.3

11. Evaluate the following integral.

$$\int_0^{\frac{\pi}{8}} \sin 2x\, dx$$

$$\int_0^{\frac{\pi}{8}} \sin 2x\, dx = \_\_\_\_\_\_\_\_\_$$

(Type an exact answer, using radicals as needed.)

ID: 5.4.17

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12. Evaluate the following integral.

$$\int_0^{\pi/4} \tan^2 x\, dx$$

$$\int_0^{\pi/4} \tan^2 x\, dx = \_\_\_\_\_\_\_\_\_$$ (Type an exact answer in terms of π.)

ID: 5.4.15

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13. Find the derivative.

$$\frac{d}{d\theta} \int_{\pi/4}^{\cot \theta} \csc^2 y\, dy$$

- A. $\csc^2(\cot \theta)$
- B. $-\csc^3 \theta \cot \theta$
- C. $\csc^2 \theta \cot \theta$
- D. $-\csc^2 \theta \csc^2(\cot \theta)$

ID: 5.4-11

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14. Find the derivative.

$$y = \int_0^{x^{10}} \cos \sqrt{t}\, dt$$

- A. $10x^9 \cos\left(x^5\right)$
- B. $\cos\left(x^5\right)$
- C. $\cos\left(x^5\right) - 1$
- D. $\sin\left(x^5\right)$

ID: 5.4-13

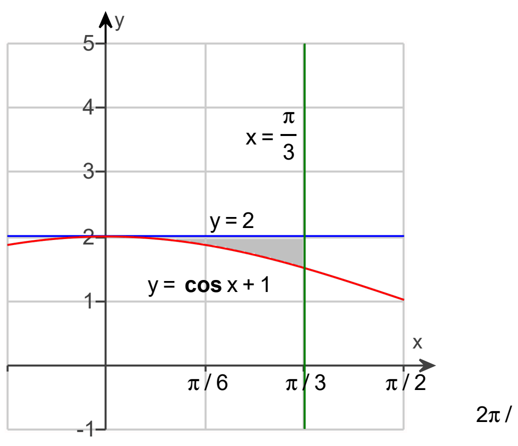
15. Find the total area of the region between the curve and the x-axis.

$$y = \frac{1}{\sqrt{x}};\ 1 \le x \le 4$$

- A. $\frac{1}{4}$
- B. $\frac{1}{2}$
- C. 4
- D. 2

ID: 5.4-23

16. Find the shaded region in the graph.



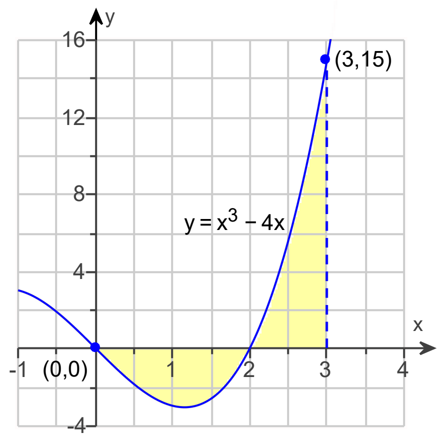
What is the area of the shaded region?

____

(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression. Type an exact answer in terms of π.)

ID: 5.4.61

17. Find the area of the shaded regions.



A. $\frac{17}{4}$

B. $\frac{33}{4}$

C. $\frac{9}{4}$

D. $\frac{41}{4}$

ID: 5.4-29

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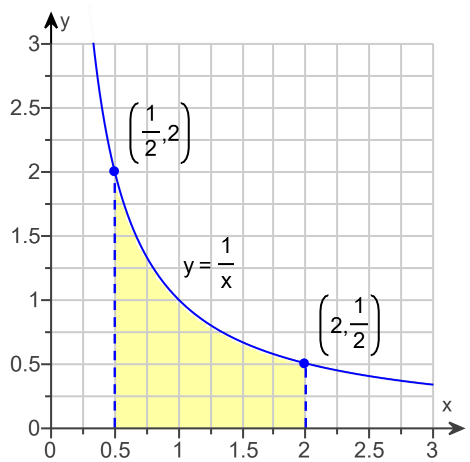
18. Find the area of the shaded region.



A. **ln** 2

B. 2 **ln** 2

C. 3 **ln** 2

D. 2 **ln** 3

ID: 5.4-30

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19. Solve the initial value problem.

$$\frac{dy}{dx} = x\left(2 + x^2\right)^4, \quad y(0) = 0$$

A. $y = \frac{1}{5}\left(2 + x^2\right)^5$

B. $y = \frac{1}{10}\left(2 + x^2\right)^5$

C. $y = \frac{1}{5}\left(2 + x^2\right)^5 - \frac{32}{5}$

D. $y = \frac{1}{10}\left(2 + x^2\right)^5 - \frac{16}{5}$

ID: 5.4-35

20. Use the substitution formula to evaluate the integral.

$$\int_{0}^{\pi/20} \left(1 + e^{\tan 5x}\right) \sec^2 5x \, dx$$

A. $-\frac{e}{5}$

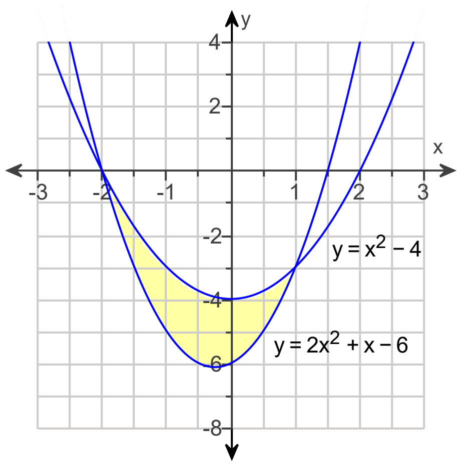
B. $5e$

C. e

D. $\frac{e}{5}$

ID: 5.6-8

21. Find the area of the shaded region.



A. $\frac{9}{2}$

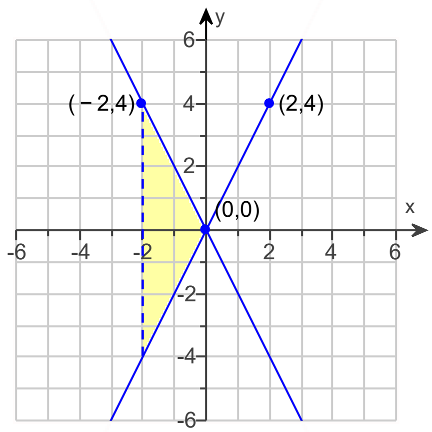
B. $\frac{11}{6}$

C. $\frac{19}{3}$

D. $\frac{8}{3}$

ID: 5.6-18

22. Set up an integral to calculate the area of the shaded region shown below.



A. $\int_{-2}^{0} (-4x)\, dx$

B. $\int_{-2}^{0} 4x\, dx$

C. $\int_{-2}^{2} 4x\, dx$

D. $\int_{-4}^{4} (-4x)\, dx$

ID: 5.6-36

23. Suppose the area of the region between the graph of a positive continuous function f and the x-axis from x = a to x = b is 5 square units. Find the area between the curves y = f(x) and y = − 3f(x) from x = a to x = b.

- A. 23 square units
- B. 20 square units
- C. 15 square units
- D. 10 square units

ID: 5.6-35

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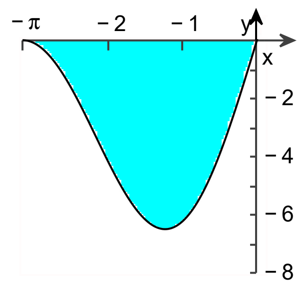
24. Find the total area of the shaded region shown to the right given by the curve $y = 6(\sin x)\sqrt{1 + \cos x}$.



The total area of the shaded region is ____________. (Type an exact answer.)

ID: 5.6.49

1. C. $\sum_{k=0}^{4} 2(k+1)$

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2. B. 126

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3. D. $2\cos\pi + 2\cos\frac{\pi}{2} + 2\cos\frac{\pi}{3} + 2\cos\frac{\pi}{4} = -1 + \sqrt{2}$

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4. C. 1; 4

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5. C. -10

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6. $\frac{125}{24}$

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7. $\frac{200}{3}$

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8. C. $\frac{609}{4}$

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9. $-\frac{238}{3}$

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10. $\frac{441}{5324}$

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11. $\frac{2-\sqrt{2}}{4}$

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12. $1 - \frac{\pi}{4}$

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13. D. $-\csc^2\theta \csc^2(\cot\theta)$

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14. A. $10x^9 \cos\left(x^5\right)$

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15. D. 2

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16. $\frac{\pi}{3} - \frac{\sqrt{3}}{2}$

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17. D. $\frac{41}{4}$

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18. B. $2 \ln 2$

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19. D. $y = \frac{1}{10}\left(2 + x^2\right)^5 - \frac{16}{5}$

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20. D. $\frac{e}{5}$

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21. A. $\frac{9}{2}$

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22. A. $\int_{-2}^{0} (-4x)\, dx$

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23. B. 20 square units

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24. $2^{7/2}$
