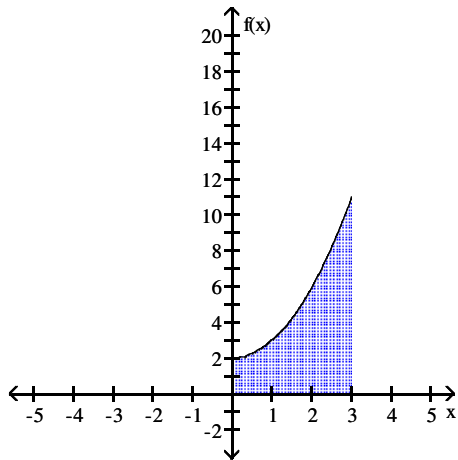


Math 180 Review 5

Set up a definite integral that represents the shaded area.

1) $y = f(x)$



Provide an appropriate response.

- 2) Find the area between the graph of $f(x) = x^2 - 4x$ and the x -axis over the interval $-3 \leq x \leq 2$. (Round answer to two decimal places.)

Solve the problem.

- 3) The Lorenz curve for the income distribution in a certain country is given by $f(x) = \frac{3}{4}x^2 + \frac{1}{4}x$.
- I) Find the Gini index.
 - II) Use the answer found in I) to determine if the income of this country is more equally distributed, less equally distributed, or distributed the same as a second country having an index of income concentration of 0.2.
- 4) The length of telephone calls (in minutes) in a public telephone booth has the probability density function:

$$f(t) = \begin{cases} \frac{1}{6}e^{-t/6} & t \geq 0 \\ 0 & \text{otherwise} \end{cases}$$

Determine the probability that a call selected at random will last between 2 and 6 minutes. (Round answer to two decimal places.)

Evaluate using integration by parts.

5) $\int x\sqrt{4-x} \, dx$

6) $\int 5xe^x \, dx$

Find the producer's surplus for the following supply function at the given point.

- 7) Find the producers' surplus at a price level of $\bar{p} = \$30$ for the price-supply equation $p = S(x) = 14 + 0.0004x^2$.

Find the consumer's surplus for the following demand function at the given point.

- 8) Find the consumers' surplus at a price level of $\bar{p} = \$7$ for the price-demand equation $p = D(x) = 25 - 0.4x$.

Solve the problem.

- 9) Find the interest earned at 5% compounded continuously for two years by a continuous income stream with rate flow of $f(t) = 1250$. (Round answer to the nearest dollar.)
- 10) Find the total income produced by a continuous income stream in the first nine years if the rate of flow is $f(t) = 5000$.
- 11) Find the future value at 8% interest compounded continuously for five years for the continuous income stream with rate of flow $f(t) = 560$. (Round answer to the nearest dollar.)

Provide an appropriate response.

- 12) Find the area bounded by the parabolas $y = 6x - x^2$ and $y = x^2 - 2x$. (Round answer to three decimal places.)
- 13) Find the area bounded by $f(x) = x^2 - 3x + 7$ and $g(x) = 2x + 7$. (Round answer to two decimal places.)

Use a graphing calculator to graph the equation over the indicated interval and find the area between the curve and the x axis over that interval. Find the answer to two decimal places.

- 14) $y = x - 4 - \ln x$; $1 \leq x \leq 8$

Evaluate using integration by parts.

15) $\int (x + 4) \ln x \, dx$

Find the indefinite integral using a table of integration formulas.

16) $\int \sqrt{x^2 + 9} \, dx$

Provide an appropriate response.

- 17) Find the area between the graph of $f(x) = 100 - 4x^2$ and the x-axis over the interval $[-5, 5]$. (Round answer to two decimal places.)
- 18) Find the area bounded by $f(x) = x^2 - 4x - 5$ and $y = x + 1$.
- 19) Find the area between the graph of $f(x) = x^2$ and the x-axis over the interval $[1, 3]$. (Round answer to two decimal places.)

Find the indefinite integral using a table of integration formulas.

20) $\int \frac{1}{\sqrt{x^2 - 16}} \, dx$

Answer Key

Testname: MATH180R5SP11

1) $\int_0^3 f(x)dx$

2) 32.33

3) I) 0.25

II) less equally distributed

4) 0.35

5) $-\frac{2}{3}x(4-x)^{3/2} - \frac{4}{15}(4-x)^{5/2} + C$

6) $5xe^x - 5e^x + C$

7) \$2133

8) \$405

9) \$129

10) \$45,000

11) \$3443

12) 21.333

13) 20.83

14) 10.42

15) $\frac{1}{2}x^2 \ln x - \frac{1}{4}x^2 - 4x + C$

16) $\frac{1}{2}(x\sqrt{x^2+9} + 9 \ln|x + \sqrt{x^2+9}|) + C$

17) 666.67

18) $\frac{343}{6}$

19) 8.67

20) $\ln(x + \sqrt{x^2 - 16}) + C$