

1. For each of the following functions, find the y -intercept and the x -intercept(s).

1a. $f(x) = -5x + 10$

i) y -intercept

ii) x -intercept(s)

1b. $g(x) = x^2 + 2x - 15$

i) y -intercept

a. 0

b. -15

c. 2

d. none

ii) x -intercept(s)

a. $-3, 5$

b. $-3, -5$

c. $3, -5$

d. $3, 5$

1c. $y = x^2 - 6x + 11$

i) y -intercept

ii) x -intercept(s)

1d. $h(x) = x^4 + 4x^3$

i) y -intercept

ii) x -intercept(s)

1e. $f(x) = 8x^2 - 2x^4$

i) y -intercept

ii) x -intercept(s)

1f. $y = 3x^{4/3} - 3x$

i) y -intercept

ii) x -intercept(s) (*Hint: Factor out $3x$.*)

1g. $f(x) = 2(x - 1)(x + 1)(x - 3)$

i) y -intercept

- a. 2
- b. -3
- c. 1
- d. 6

ii) x -intercept(s)

- a. 1, -1, 3
- b. 2, 1, -1, 3
- c. 6
- d. 2, 1, 3

2. Find the y -intercept, x -intercept(s), and domain of each of the following functions.

2a. $h(x) = 3 - 2x$

y -intercept =

x -intercept(s) =

domain =

2b. $P(x) = x^2 - 2x - 15$

y -intercept =

x -intercept(s) =

domain =

2c. $g(x) = \frac{3x - 6}{x - 1}$

y -intercept =

- a. 1
- b. 2
- c. 6
- d. 3

x -intercept(s) =

- a. 1
- b. 2
- c. 6
- d. 3

domain =

- a. all real numbers except 0
- b. all real numbers except 2 and 6
- c. all real numbers
- d. all real numbers except 1

2d. $m(x) = (x - 2)^{1/2}$

y -intercept =

- a. none
- b. -1
- c. 0
- d. $-\sqrt{2}$

x -intercept(s) =

- a. none
- b. 2
- c. 0
- d. 4

domain =

- a. all real numbers
- b. all real numbers except 2
- c. all real numbers greater than or equal 3
- d. all real numbers at least 2

2e. $n(x) = (x - 2)^{-2}$

y -intercept =

- a. none
- b. $\frac{1}{4}$
- c. 0
- d. -4

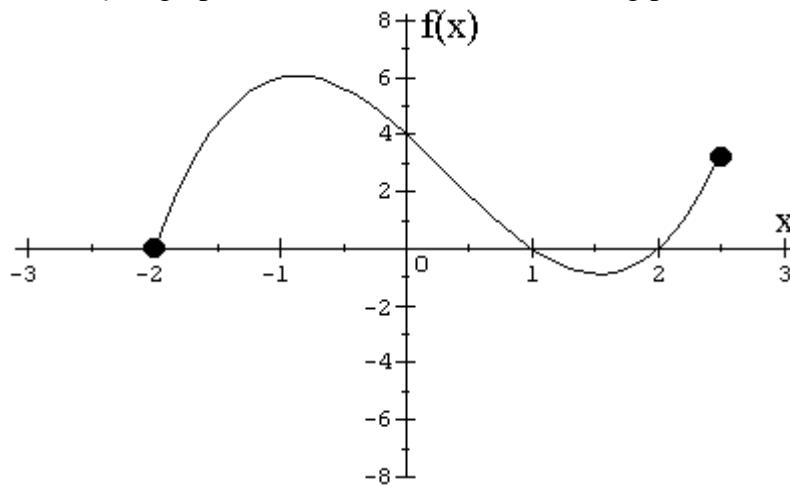
x -intercept(s) =

- a. none
- b. 2
- c. 0
- d. 1

domain =

- a. all real numbers
- b. all real numbers except 2
- c. all real numbers except 0
- d. all real numbers at least 2

3. A function named f is graphed below. Each of the following parts 3a–3c pertains to this function.

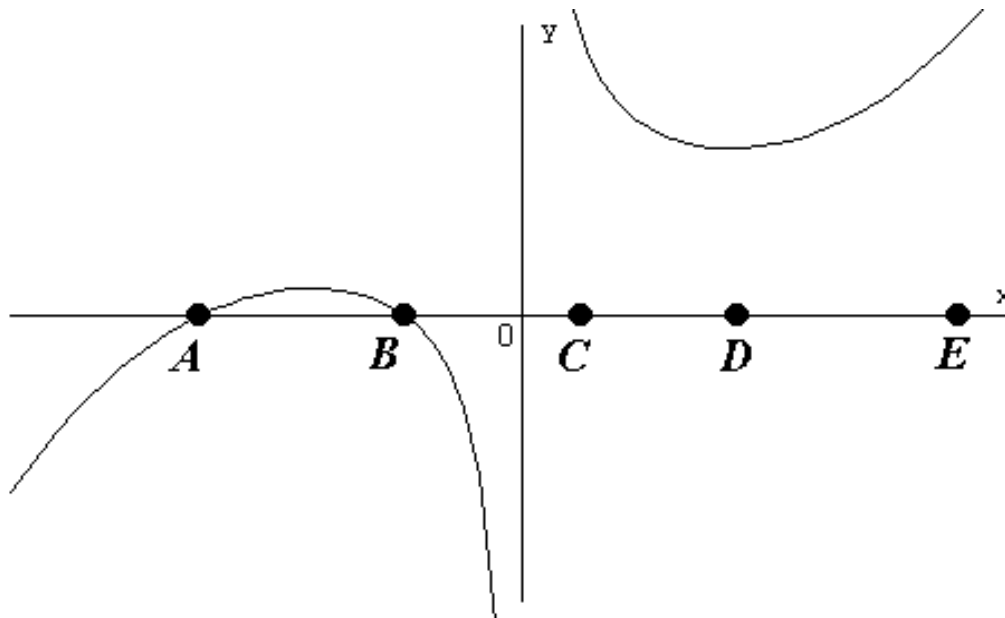


3a. Write the domain of f .

3b. Find the x -intercept(s) of f .

3c. Find the y -intercept of f .

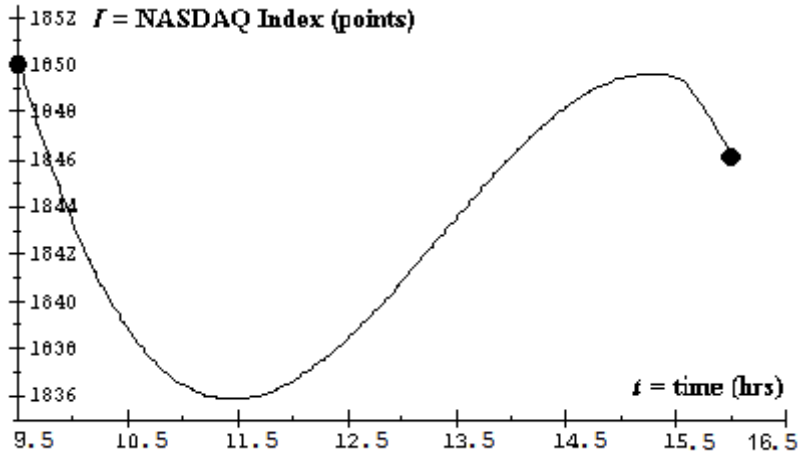
4. A function named g is graphed on the set of axes shown below. Each of the following parts 4a–4b pertains to this function.



4a. Find the x -intercept(s).

4b. Find the y -intercept.

5. The NASDAQ Composite Index is a numerical value that roughly measures the price of all stocks traded on the NASDAQ Stock Exchange. This exchange has become more important in recent years, since the stocks of many high-tech companies are traded there. The following graph depicts the value of the NASDAQ index (I) over the course of a recent trading day. The input axis is marked off in military time, where $t = 9.5$ corresponds to 9:30 am and $t = 16$ corresponds to 4 pm.



5a. Write the domain of the function I .

In practical terms, what does this domain tell you about the NASDAQ Stock Exchange?

5b. Is the value 1835 in the range of the function I ? Yes No

5c. Interpret $I(16)$ in the problem context using a complete sentence.

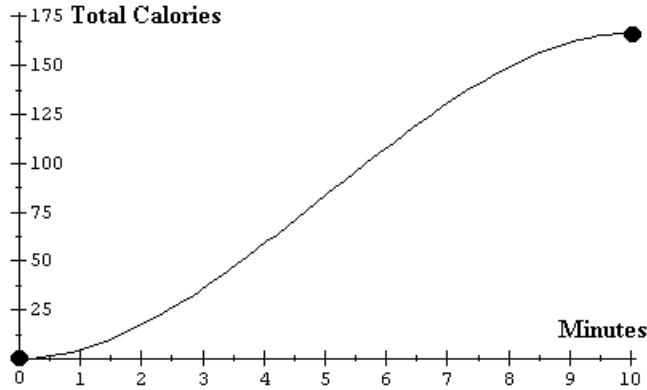
5d. Evaluate $I(14) =$

5e. Express the following statement in function notation: The value of the NASDAQ index at opening time was 1850.

5f. Write the input and output variables.

5g. Write the units of measure for the input and output quantities.

6. The Hard-Body Elliptical Crosstrainer fitness machine has an LCD display that graphs the total calories burned during a workout. Suppose the display appeared roughly as shown below after Imani's last workout on the machine. Let T be the total calories burned after m minutes of the workout.



6a. Write the domain of the function T .

- a. all real numbers between 0 and 10, inclusive
- b. all real numbers between 0 and 165, inclusive
- c. all real numbers
- d. all real numbers at least 0

In practical terms, what does this domain tell you about Imani's last workout?

- a. Imani burned 170 calories during her last workout.
- b. Imani burned 10 calories during her last workout.
- c. Imani's last workout lasted 10 minutes.
- d. The number of calories Imani burned increased steadily during her last workout.

6b. Is the value 140 in the range of the function T ? Yes No

- a. Yes
- b. No

6c. Interpret $T(4)$ in the problem context using a complete sentence.

- a. The number of minutes it took Imani to burn 4 calories.
- b. The number of calories Imani burned after 4 minutes.
- c. The number of calories Imani burned times 4.
- d. Imani burned 4 calories per minute.

6d. Evaluate $T(8) =$

- a. 150
- b. 680
- c. 1
- d. 80

6e. Express the following statement in function notation: Imani burned 170 calories altogether during her last workout.

- a. $T = 170$
- b. $T/10 = 17$
- c. $T(10) = 170$
- d. $T(170) = 10$

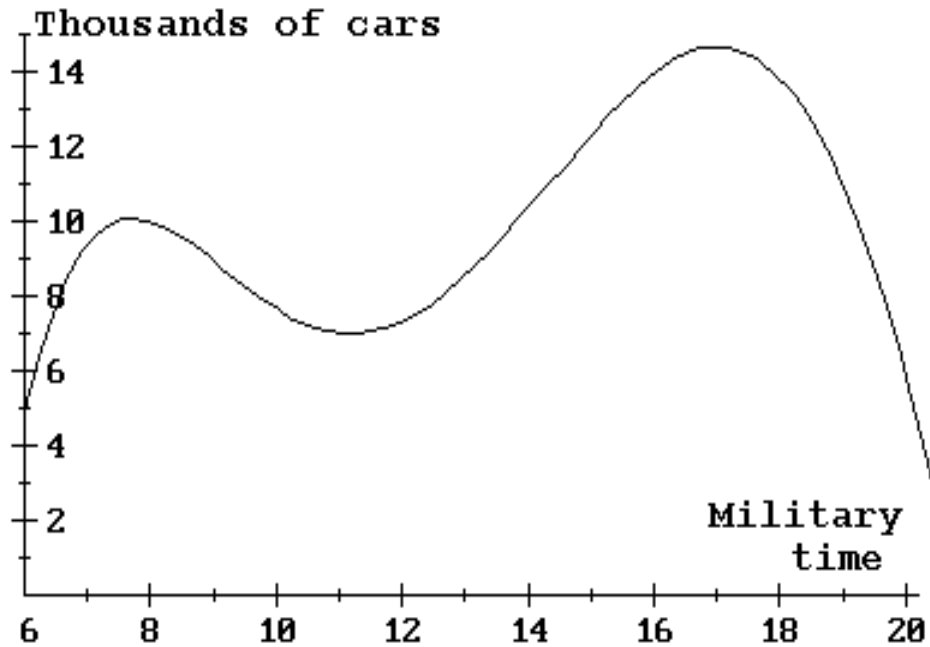
6f. Write the input and output variables.

- a. input $\rightarrow m$, output $\rightarrow T$
- b. input $\rightarrow x$, output $\rightarrow y$
- c. input $\rightarrow y$, output $\rightarrow x$
- d. input $\rightarrow T$, output $\rightarrow m$

6g. Write the units of measure for the input and output quantities.

- a. input \rightarrow calories, output \rightarrow minutes
- b. input \rightarrow time, output \rightarrow energy
- c. input \rightarrow speed, output \rightarrow pounds
- d. input \rightarrow minutes, output \rightarrow calories

7. The following graph shows the average number of cars (in thousands) traveling on the Gridlock Expressway in Gotham City during a typical weekday from 6 am to 8 pm (the input axis is marked off in military time). For example, military time 14 corresponds to 2 pm. Suppose C is the number of cars (in thousands) on this expressway at time t (military time).



7a. Write the domain of the function C .

7b. Interpret $C(13)$ in the problem context using a complete sentence.

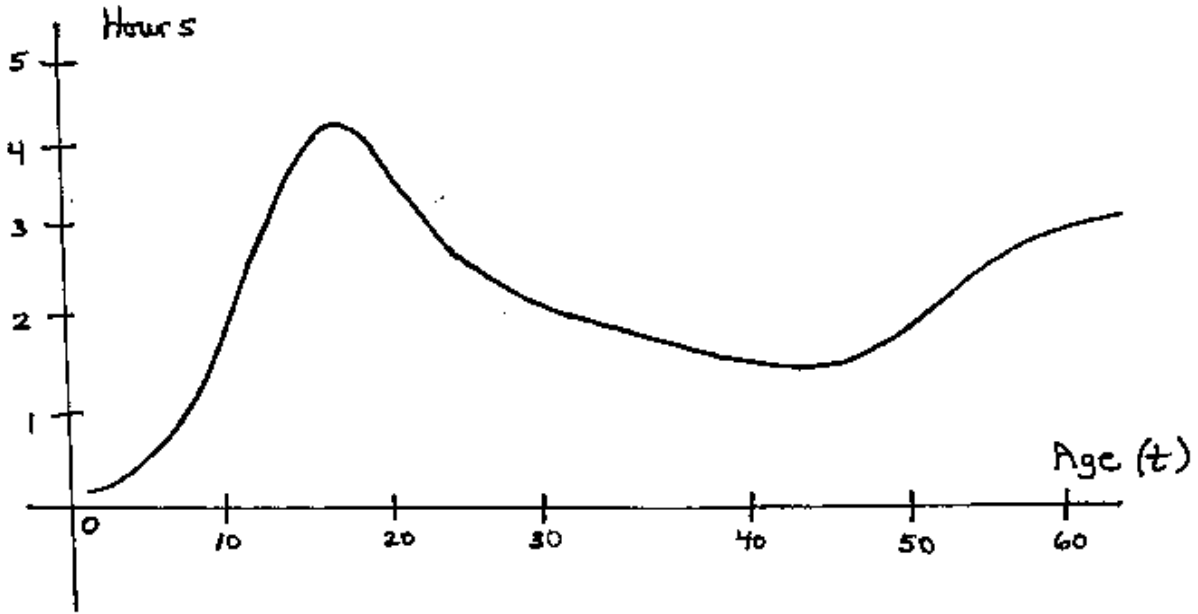
7c. Evaluate $C(20)$.

7d. Express the following statement in function notation: There are 10,000 cars on the Gridlock Expressway at 8 am on a typical weekday.

7e. Write the input and output variables.

7f. Write the units of measure for the input and output quantities.

8. The function $V = f(t)$ graphed here depicts the number of hours each day typical Americans from age 3 years to age 60 years spend watching TV.



8a. Write the domain of the function f .

8b. Is the value 4 in the range of the function f ? Yes No

8c. Interpret $f(45)$ in the problem context using a complete sentence.

8d. Evaluate $f(10) =$

8e. Express the following statement in function notation: A typical 50 year-old American watches 2 hours of TV each day.

8f. Write the input and output variables.

8g. Write the units of measure for the input and output quantities.

MATH 1306 – Handout # 1
Answers To Odd-numbered Problems

- 1a. i) $y = 10$
ii) $x = 2$
- 1b. i) $y = -15$
ii) $x = -5, x = 3$
- 1c. i) $y = 11$
ii) none
- 1d. i) $y = 0$
ii) $x = -4, x = 0$
- 1e. i) $y = 0$
ii) $x = -2, x = 0, x = 2$
- 1f. i) $y = 0$
ii) $x = 0, x = 1$
- 1g. i) $y = 6$
ii) $x = -1, x = 1, x = 3$
- 3a. Verbal description: All real numbers between -2 and 2.5 , inclusive
Interval notation: $[-2, 2.5]$
- 3b. $x = -2, x = 1, x = 2$
- 3c. $y = 4$
- 5a. Verbal description: All real numbers between 9.5 and 16 , inclusive
Interval notation: $[9.5, 16]$
The daily hours of operation for the NASDAQ are 9:30 am to 4 pm.
- 5b. No
- 5c. $I(16)$ stands for the closing value of the NASDAQ (at 4 pm) on a recent trading day.
- 5d. $I(14) = 1846$
- 5e. $I(9.5) = 1850$
- 5f. t, I

5g. hours , points

7a. Verbal description: All real numbers between 6 and 20, inclusive
Interval notation: $[6, 20]$

7b. $C(13)$ stands for the number of cars in thousands traveling on the Expressway at 1 pm.

7c. $C(20) = 6$

7d. $C(8) = 10$

7e. t, C

7f. hours , thousands of cars