

1.1 Change in Tandem

AP Precalculus

SOLUTIONS

1.1 Practice

For each function, identify what the dependent and independent variables represent.

1. $b(s)$ is a function where b is the number of books in the library and s is the number of students in the school.

Dep: number of books in the library

Indep: number of students in the school

2. $p(t)$ is a function where t is the number of years since kindergarten and p is the number of Pokemon cards.

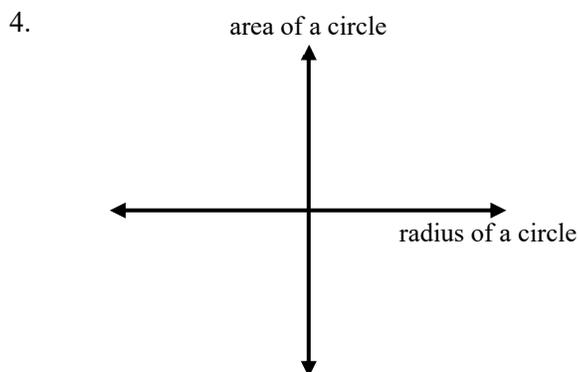
Dep: number of Pokemon cards

Indep: number of years since kindergarten

3. $c(t)$ is a function where c is the number of cups of coffee consumed and t is the number of teachers at the school.

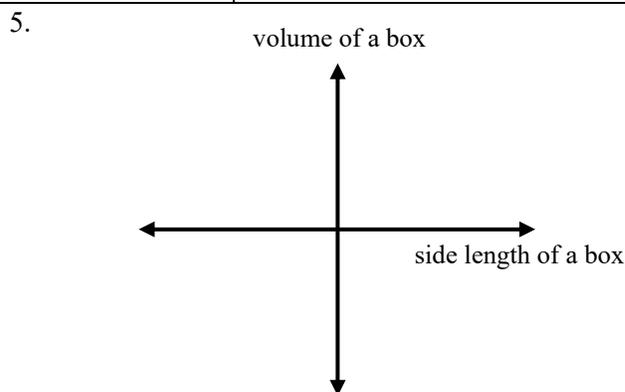
Dep: number of cups of coffee

Indep: number of teachers at the school



Dep: area of a circle

Indep: radius of a circle



Dep: volume of a box

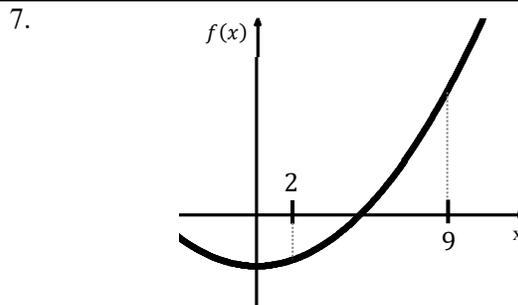
Indep: side length of a box

Let the function f be increasing or decreasing, but not both. State whether the function is increasing or decreasing on the given interval and justify your answer.

6.

x	1	2	3	4	5
$f(x)$	95	90	75	50	10

f is decreasing on the interval $1 < x < 5$ because for all a and b in the interval, if $a < b$, then $f(a) > f(b)$.



f is increasing on the interval $2 < x < 9$ because for all a and b in the interval, if $a < b$, then $f(a) < f(b)$.

8.

x	12	16	18	25	31
$f(x)$	8	7.99	7.8	7.75	7.7

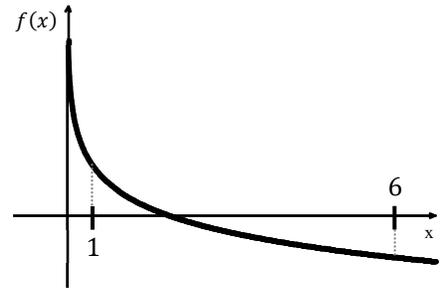
f is decreasing on the interval $12 < x < 31$ because for all a and b in the interval, if $a < b$, then $f(a) > f(b)$.

10.

x	101	201	301	401	501
$f(x)$	10	11	12	13	14

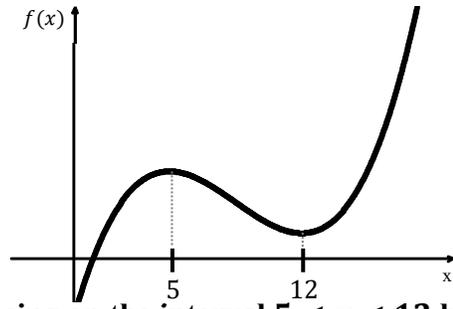
f is increasing on the interval $101 < x < 501$ because for all a and b in the interval, if $a < b$, then $f(a) < f(b)$.

9.



f is decreasing on the interval $1 < x < 6$ because for all a and b in the interval, if $a < b$, then $f(a) > f(b)$.

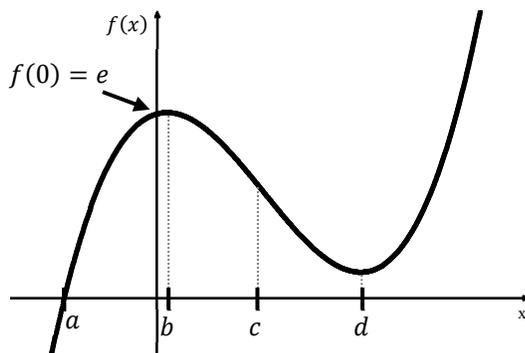
11.



f is decreasing on the interval $5 < x < 12$ because for all a and b in the interval, if $a < b$, then $f(a) > f(b)$.

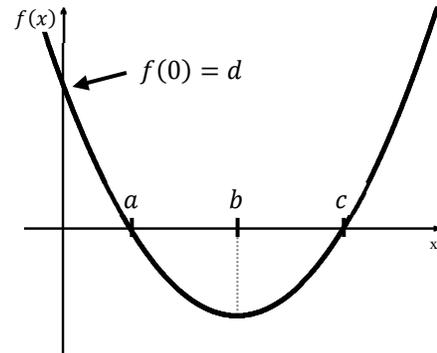
Use the graph of f to answer the question below.

12.



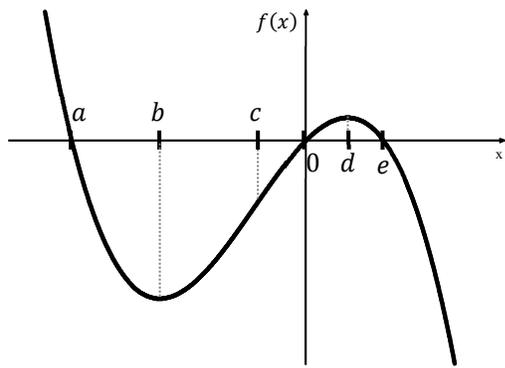
- On what interval(s) is the graph concave up?
 $x > c$
- On what interval(s) is the graph concave down?
 $x < c$
- On what interval(s) is the graph increasing?
 $x < b$ and $x > d$
- On what interval(s) is the graph decreasing?
 $b < x < d$
- Find the zeros of the function.
 $x = a$
- Find the y-intercept of the function.
 $y = e$

13.



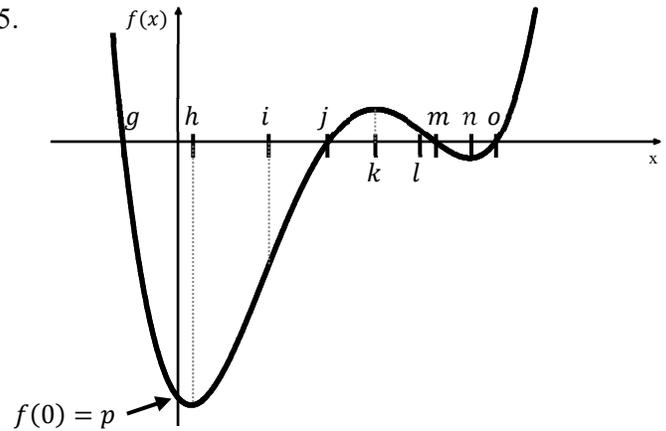
- On what interval(s) is the graph concave up?
 \mathbb{R} (all real numbers)
- On what interval(s) is the graph concave down?
none
- On what interval(s) is the graph increasing?
 $x > b$
- On what interval(s) is the graph decreasing?
 $x < b$
- Find the zeros of the function.
 $x = a$ and $x = c$
- Find the y-intercept of the function.
 $y = d$

14.



- On what interval(s) is the graph concave up?
 $x < c$
- On what interval(s) is the graph concave down?
 $x > c$
- On what interval(s) is the graph increasing?
 $b < x < d$
- On what interval(s) is the graph decreasing?
 $x < b$ and $x > d$
- Find the zeros of the function.
 $x = a, x = 0$ and $x = e$
- Find the y-intercept of the function.
 $y = 0$

15.



- On what interval(s) is the graph concave up?
 $x < i$ and $x > l$
- On what interval(s) is the graph concave down?
 $i < x < l$
- On what interval(s) is the graph increasing?
 $h < x < k$ and $x > n$
- On what interval(s) is the graph decreasing?
 $x < h$ and $k < x < n$
- Find the zeros of the function.
 $x = g, j, m$ and o
- Find the y-intercept of the function.
 $y = p$

1.1 Change in Tandem

1.1 Test Prep

Multiple Choice

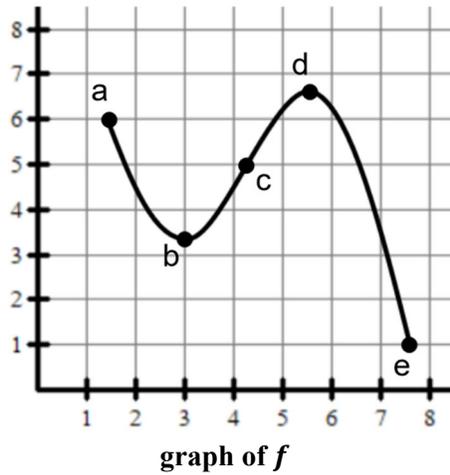
16. Let the function f be defined as a function that is always decreasing. The table shows values for the function f at selected values of x . Which of the following represents all possible values for a ?

- $-5 < a < 7$
- $-2 < a < 0$
- $0 < a < 3$
- $-2 < a < 4$
- $-15 < a < 12$

D

x	$f(x)$
-5	12
-2	4
0	a
3	-2
7	-15

For questions 17-18 use the graph of f .



17. The figure shows the graph of a function f . Let a , b , c , d , and e represent the x -coordinates at those points. Of the following, which is a point of inflection?

- (A) point a
- (B) point b
- (C) point c
- (D) point d
- (E) point e



18. The figure shows the graph of a function f . Let a , b , c , d , and e represent the x -coordinates at those points. Of the following, on which interval is f decreasing and the graph of f concave down?

- (A) The interval from a to b .
- (B) The interval from b to c .
- (C) The interval from c to d .
- (D) The interval from d to e .
- (E) None of the above.

