Chapter 3 Review

1 What is the domain of the function $f(x) = \frac{x + 3}{x^2 - 7x + 12}$?

A All real numbers

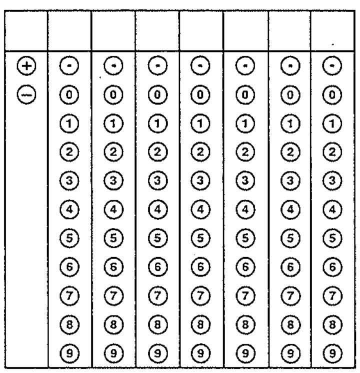
B All real numbers except −3

C All real numbers except 3

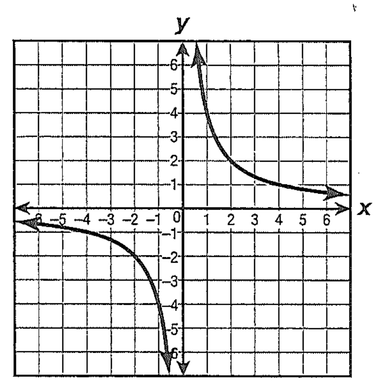
D All real numbers except 3 and 4

2 Solve for x: $\log_3 27 = x + 7$

Record your answer and fill in the bubbles below.



3 Which function describes the graph shown below?



A $f(x) = \frac{4}{x}$

B $f(x) = \log_4 x$

C $f(x) = -\frac{4}{x}$

D $f(x) = \frac{1}{x + 4}$

4 A book store offers a membership deal to its customers. Members pay a total of \$50 for the first 5 books, and then \$5 for each additional book. What is the number of books that must be purchased in order to make the average cost per book \$6?

A 16

B 18

C 25

D 28

Duplicating any part of this book is prohibited by law.

5 Which is an asymptote of the function $f(x) = 3e^x - 3$?

A $x = -3$

B $x = 3$

C $y = -3$

D $y = 3$

6 At a soap factory, the cost per bar, in dollars, to make s bars of soap is modeled by the function $f(s) = \frac{1{,}275 + 0.05s}{s}$. Which table represents this function?

A

s	100	150	250	300
$f(s)$	12.8	8.55	5.15	4.30

B

s	50	100	150	200
$f(s)$	25.55	11.7	7.75	6.25

C

s	100	200	300	400
$f(s)$	15.5	13.2	11.05	9.35

D

s	50	150	250	350
$f(s)$	25.55	9.05	4.95	2.8

7 Which function is the inverse of $f(x) = 5^{x-6}$?

A $g(x) = \log_5(x - 6)$

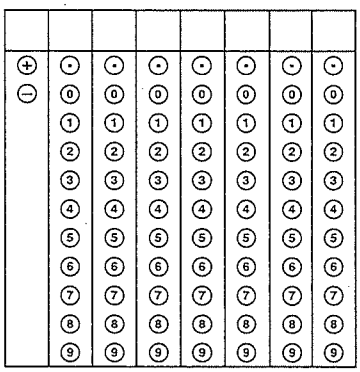
B $g(x) = \log_5(x + 6)$

C $g(x) = \log_5 x - 6$

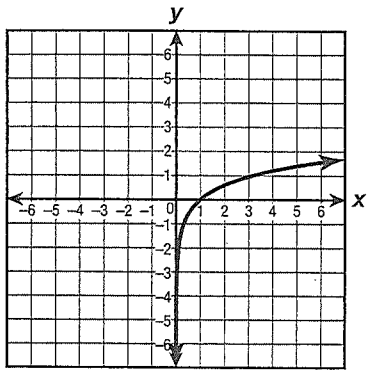
D $g(x) = \log_5 x + 6$

8 A small business spent \$578 on coffee this year. If the company increases the amount it spends on coffee by 5% each year, how much will they spend on coffee 7 years from now, to the nearest dollar?

Record your answer and fill in the bubbles below.

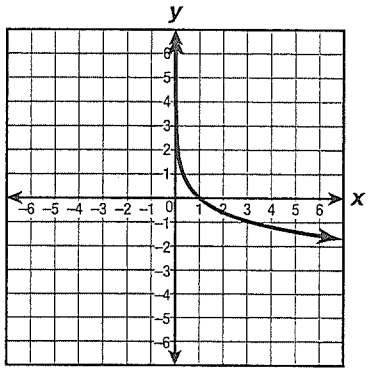


9 The graph of the function f is shown below.

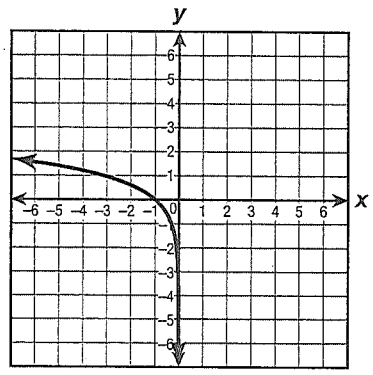


Which grid shows the graph of f^{-1}?

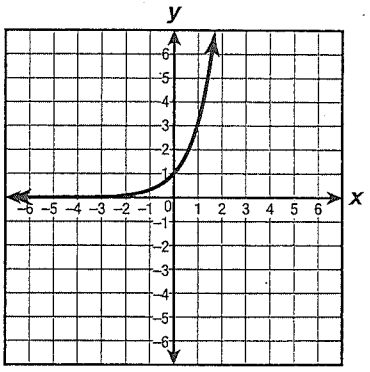
A



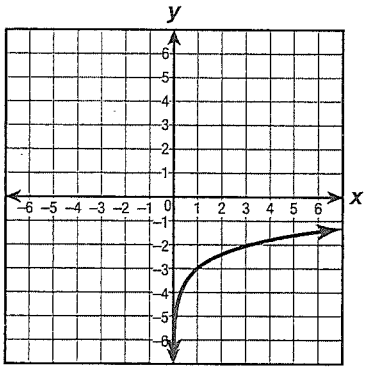
C



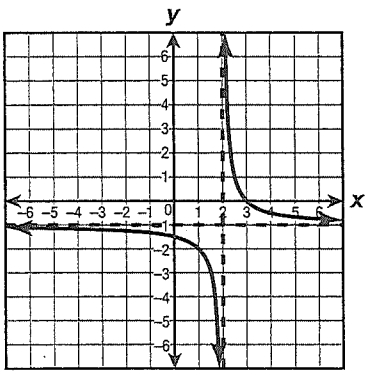
B



D



10 The graph below shows the function $f(x) = \frac{1}{x-2} - 1$.



Which is the solution to $\frac{1}{x-2} - 1 > 0$?

A $2 < x < 3$

B $1 < x < 2$

C $3 < x$

D $2 > x$

11 As part of a botany experiment, the concentration of nutrients in milligrams per milliliter in a flower can be modeled by the function below, where t represents the time in days since the experiment began.

$$f(t) = \frac{500}{t^2 + 4t + 4}$$

In this situation, what are the domain and range for this function?

A Domain: $t \leq 0$;
range: $0 < f(t) \leq 125$

B Domain: $t \leq 0$;
range: $f(t) \geq 125$

C Domain: $t \geq 0$;
range: $0 < f(t) \leq 125$

D Domain: $t \geq 0$;
range: $f(t) \geq 125$

12 The table below represents the function $f(x) = \frac{1}{2} \cdot 6^{x+3} - 3$.

x	$f(x)$
−3	−2.5
−2	0
−1	15
0	105
1	645
2	3885

Which is the solution to $\frac{1}{2} \cdot 6^{x+3} - 3 \leq 0$?

A $-3 \geq x \leq -2$

B $-2 \geq x \leq 0$

C $x \geq -2$

D $x \leq -2$

13 Solve for n:

$$\frac{15}{n+2} + \frac{4}{n-1} = \frac{50}{(n+2)(n-1)}$$

A 5

B 4

C 3

D 2

14 The growth of a worm, in millimeters, can be modeled by the function below, where t represents the time, in days, since the worm hatched. The average life span for this type of worm is around a month.

$$f(t) = 25\log(3t + 1)$$

In this situation, what are a reasonable domain and range for this function?

A Domain: $t \geq 0$;
range: $f(t) \geq 0$

B Domain: $t \geq 0$;
range: $0 < f(t) \leq 50$

C Domain: $0 \leq t \leq 0$;
range: $f(t) \geq 0$

D Domain: $0 \leq t \leq 30$;
range: $0 < f(t) \leq 50$

15 A team of 15 workers framed and built a barn in 12 hours. How many hours would it take 9 workers, working at the same pace, to build a similar barn?

Record your answer and fill in the bubbles below.

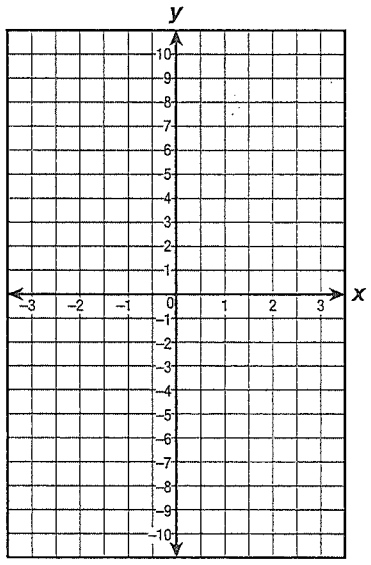
⊕	⊙	⊙	⊙	⊙	⊙	⊙	⊙
⊖	⓪	⓪	⓪	⓪	⓪	⓪	⓪
	①	①	①	①	①	①	①
	②	②	②	②	②	②	②
	③	③	③	③	③	③	③
	④	④	④	④	④	④	④
	⑤	⑤	⑤	⑤	⑤	⑤	⑤
	⑥	⑥	⑥	⑥	⑥	⑥	⑥
	⑦	⑦	⑦	⑦	⑦	⑦	⑦
	⑧	⑧	⑧	⑧	⑧	⑧	⑧
	⑨	⑨	⑨	⑨	⑨	⑨	⑨

Duplicating any part of this book is prohibited by law.

16 **A.** On the grid below, sketch the graph of $f(x) = 3^x$ and label it $f(x)$.

B. Predict how the graph of $g(x) = -3^x - 1$ compares to the graph of $f(x) = 3^x$.

C. Sketch the graph of $g(x) = -3^x - 1$ on the coordinate grid and label it $g(x)$.



17 A monthly online news subscription charges \$5.00 to download the first 60 articles and \$0.25 for each additional article. For the questions below, assume that a minimum of 60 articles is downloaded each month.

A. Let a = the number of articles downloaded in a month. What function, $f(a)$, give the total cost per month if $a \geq 60$?_____

B. What function, $g(a)$, gives the average cost per article in a month if $a \geq 60$?

_____

C. Find the values of a that makes $g(a) \geq 0.15$. _____