Section 3.1

1. - 1/4

2. 2

7. 1/4

8. 2

13. b

14. a

15. d

16. c

17. a) y = 5x - 7
    b) y = (-1/5) x + (17/5)
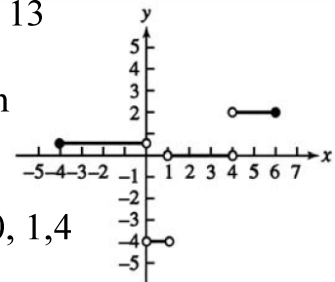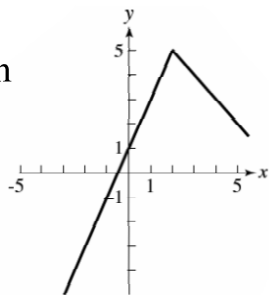
18. y' = 4x - 13
    y = - x - 13

23. a) 0 and 0
    b) 1700 and 1300

26. a) graph

b) x = 0, 1,4

28. graph

36. true

37. false

38. C

39. A

40. B

41. C

23.

Number of rabbits

2000

Initial no. rabbits = 1000
Initial no. foxes = 40

(20, 1700)

1000

Number of foxes

0

0   50   100   150   200
Time (days)
(a)

+100

50

(20, 40)

0

−50

−100

0   50   100   150   200
Time (days)
Derivative of the rabbit population
(b)
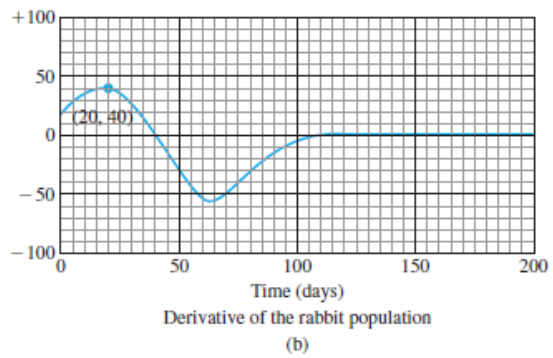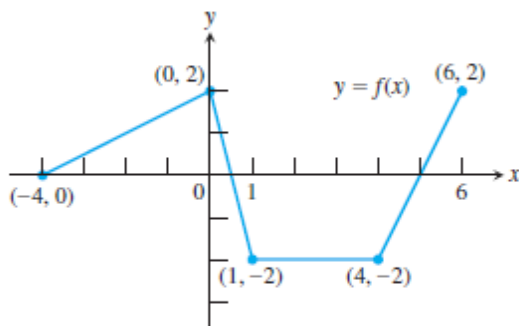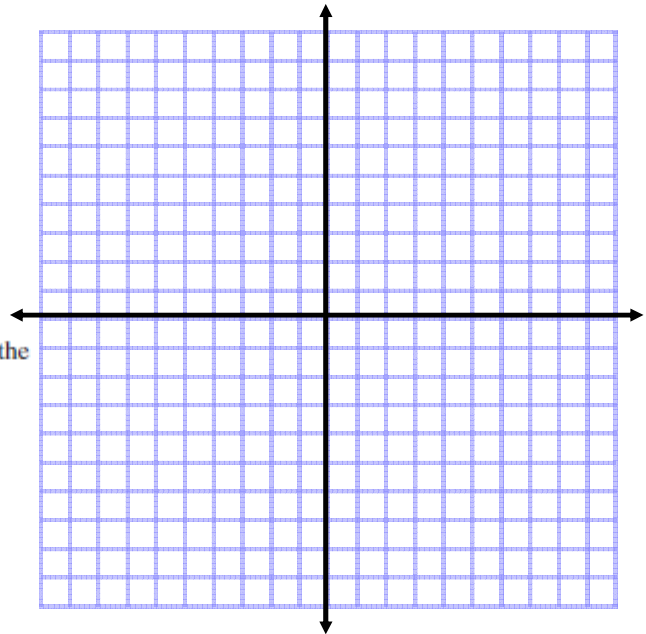
2
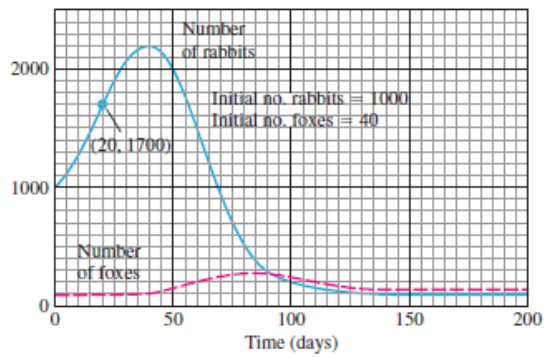
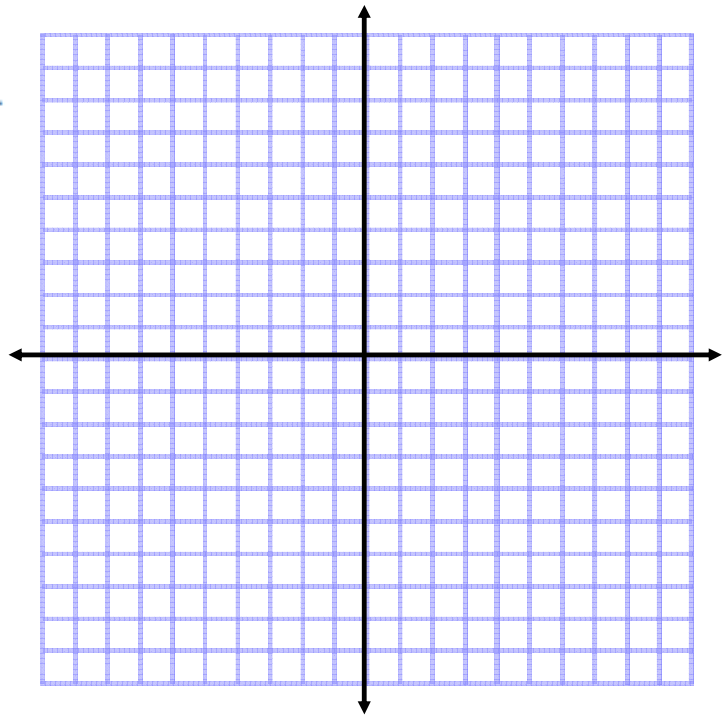**26.** The graph of the function $y = f(x)$ shown here is made of line segments joined end to end.

(a) Graph the function's derivative.

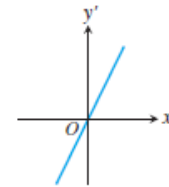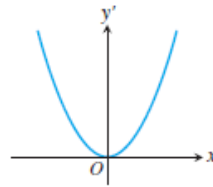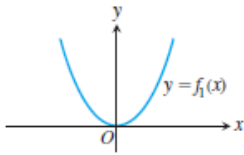(b) At what values of x between $x = -4$ and $x = 6$ is the function not differentiable? $x = 0, 1, 4$

27. **Graphing f from f′** Sketch the graph of a continuous function f with $f(0) = -1$ and
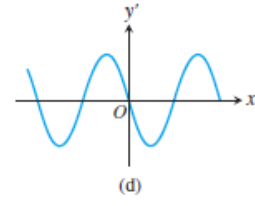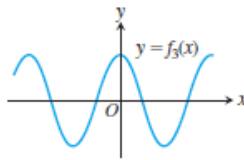
$$f'(x) = \begin{cases} 1, & x < -1 \\ -2, & x > -1. \end{cases}$$

13.
(b)

$y = f_1(x)$

14.
(a)

$y = f_2(x)$

15.
(d)

$y = f_3(x)$

16.
(c)

$y = f_4(x)$

(a)

(b)

(c)

(d)

5