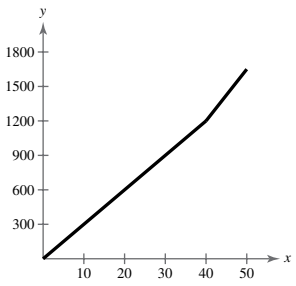
Functions and Their Graphs Answers

1. a. $E(x) = \begin{cases} 30x, & 0 \le x \le 40 \\ 45x - 600, & 40 < x \le 50 \end{cases}$;

Yes; When $0 \le x \le 40$, $30x$ is of the form kx.



b. $E(35) = \$1050;\ E(50) = \$1650$

c. $0 \le x \le 40$: $m = 30$; You earn \$30 for each hour worked;
$40 < x \le 50$: $m = 45$; You earn \$45 for each hour worked.

d. Both the x-intercept and the y-intercept are 0, so there are no earnings for no work.

e. 47 h

2. a. $d(x) = 85x + 95$ is the total untaxed cost of x tons of salt and delivery.

b. $c(x) = 1.07x$

c. $(d \circ c)(x) = 85(1.07x) + 95 = 90.95 + 95$; The cost of x tons of salt taxed at 7% plus the cost of untaxed delivery; $(c \circ d)(x) = 1.07(85x + 95) = 90.95x + 101.65$; The total cost of x tons of salt plus the cost of delivery, all taxed at 7%

d. \$1277.35

3. a. The graphs seem to show that similar patterns are expected as last year, but 4 weeks later; $P(x) = F(x - 4)$

b. P is increasing on the interval $(0, 8)$, constant on the interval $(8, 12)$, decreasing on the interval $(12, 20)$.

c. The midpoint is $(20, 12{,}500)$; Revenues are projected to be \$12,500 in the 20th week after the first full week in October.

4. $-\$6200/1$ yr; $f(x) = 60{,}000 - 6200x$; $f^{-1}(x) = \dfrac{60{,}000 - x}{6200}$; $f^{-1}(35{,}200) = 4$, so the value of the truck is \$35,200 after 4 years.