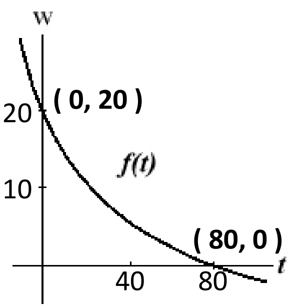
1. True or False: Given that the point (5, 8) is on the graph of *f* is enough information to find the value of *f*(5).
Ans. **True since *f*(5) = 8.**

2. If $7 = g(5)$, give the coordinates of a point on the graph of g. (**5**, **7**)

3. Tuition cost *T* (in dollars) for part-time students at a college is given by *T* = 300 + 200*C*, where *C* represents the number of credits taken.
a. Find the tuition cost for six credits. Taking six credits costs $**1500**
b. How many credits were taken if the tuition was $2,100? $2,100 is the cost of taking **9** credits.
2100 = 300 + 200*C*
1800 = 200*C*
C* = *9

4. Suppose *w* = *f*(*t*) is given by the graph to the right.
Use the graph to find complete the blanks.



a. $f(0) =$ **20**
b. $f^{-1}($**20**$) = 0$
c. $f^{-1}(0) =$ **80** **since *f*(80) = 0**
d. $f^{-1}($**20**$) = 0$ **since *f*(0) = 20**

5. The table gives the amount of garbage, G, in tons, produced in a country in year *t*, so *G= f(t)* since 1950.

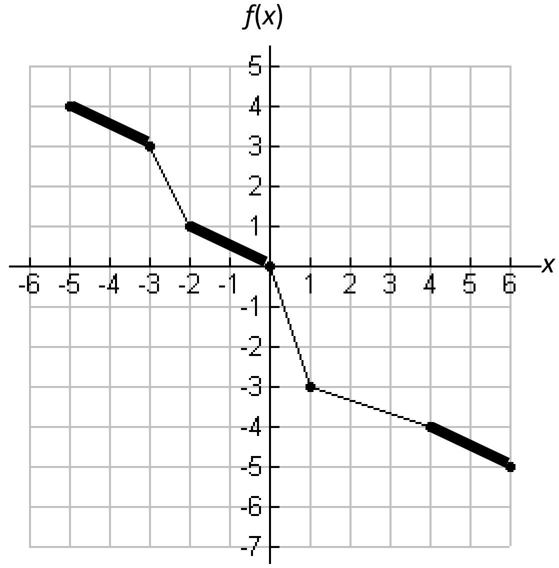
t	*G*
30	30
40	35
50	40
60	45

a. Find *f*(40) and interpret.
_f_(40) = 35. In 1990, the country produced 35 tons of trash.
b. Solve *f*(*t*) =40 for *t* and interpret. **_f_(50) = 40. The country produced 40 tons of trash in the year 2000.**
c. Find the average rate of change of the function from 30 to 40. ***0.5 tons of trash per year.***
Report units in your answer.
d. Find a formula for *f*(*t*) assuming the garbage increases at a steady rate. **_f_(_t_) = 0.5_t_ + 15**
y = 0.5t + b
35 = 0.5(40) + b
35 = 20 + b
15 = b
e. Interpret the slope of your formula in practical terms. Don't write RISE over RUN.
Each year the country produces an additional 0.5 ton of trash.
or Every 10 years the country produces 5 tons of trash.
f. Interpret the *y*-intercept of your formula in practical terms. **In 1950 they had 15 tons of trash.**
g. Predict the amount of garbage in the year 2050, assuming this trend continues.
Find _G_ if _t_ = 100. We can use the formula or "walk the table."
G **= 0.5(100) + 15**
= 50 + 15
= 65 tons.

t	*G*
30	30
40	35
50	40
60	45
70	**50**
80	**55**
90	**60**
100	**65**

6. In 2006, the population of a town was 15,423 and growing by 200 people per year. Find a formula for *P,* the town's population, in terms of *t,* the number of years since 2006. ***P* = 15,423 + 200*t***

7. Determine two intervals on which the average rate of change is the same. Use integers and write a different number in each blank. (Many correct answers are possible.)



The average rate of change from x = **−5** to x = **−3**
is the same value as the
the average rate of change x = **−2** to x = **0**

or the average rate of change x = **4** to x = **6**.

Find intervals of x where slope is the same.

8. If $f(x)=\dfrac{4x}{x^2+4}$, then evaluate $f(-1)$

$$\frac{4(-1)}{(-1)(-1)+4}=\frac{-4}{5} \text{ or } -0.8$$

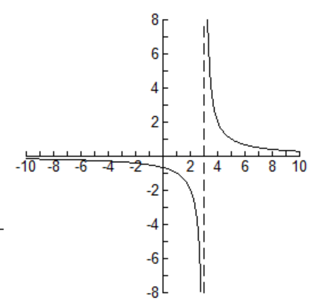
9. If $f(x)=\sqrt{16x+4}$, then solve the equation $f(x)=0$

$\sqrt{16x+4}=0$ Square both sides.

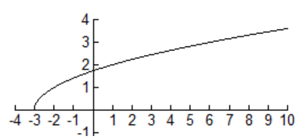
$$16x+4=0$$
$$16x=-4$$
$$x=\frac{-4}{16} \text{ or } -0.25$$

10. Find the domain and range of

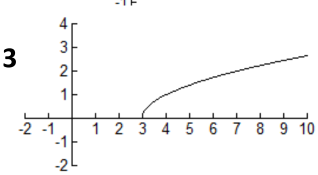
a. $f(x)=\dfrac{2}{x-3}$ Domain: **x ≠ 3**
Range: **All reals but 0** or **y ≠ 0**



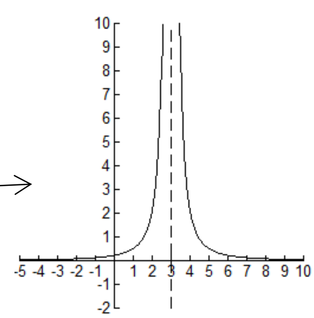
b. $g(x)=\sqrt{x+3}$ Domain: ***x* ≥ −3**
Range: ***y* ≥ 0**



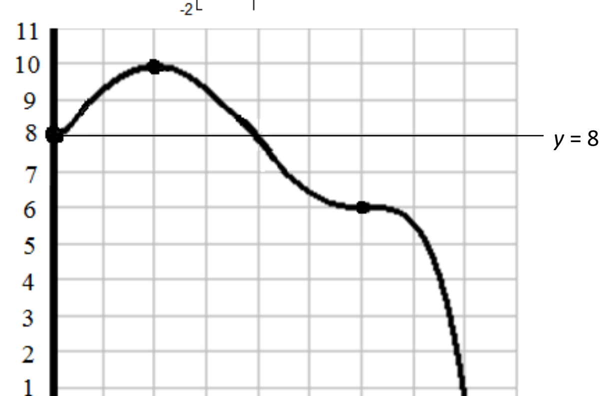
c. $h(x)=\sqrt{x-3}$ Domain: ***x* ≥ 3**
Range: ***y* ≥ 0**



d. $p(x)=\dfrac{2}{(x-3)^2}$ Domain: **x ≠ 3**
Range: **y > 0**



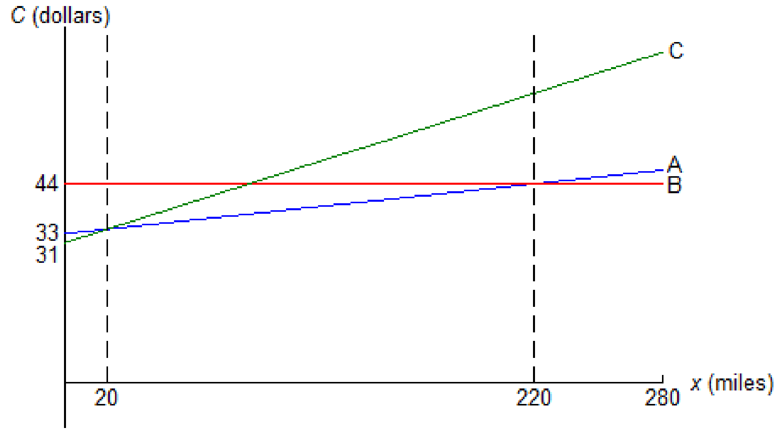
11. The entire graph of $g(x)$ is shown.
Insert whole numbers (integers) in the boxes.
a. What is the domain of g? **0 ≤ *x* ≤ 8**
b. What is the range of g? **0 ≤ *y* ≤ 10**
c. Report all values of x which solve the equation $g(x) = 8$.
***x* = 0, 4**
d. Solve $g(x) \geq 8$. Ans: **0 ≤ *x* ≤ 4** or **[0, 4]**
Find values of x for which the graph of g is **above** the line $y = 8$ or **intersects** the line $y = 8$.



e. Solve $g(x) < 8$. Ans: $\mathbf{4 < x \leq 8}$ or **(4, 8]**
Find values of x for which the graph of g is **below** the line.

f. For what values of x is the function increasing?

12. a. $y_A = 33 + 0.05x$
$y_B = 44$
$y_C = 31 + 0.15x$



b. Company A (the blue graph) is cheapest when you drive between 20 and 220 miles.
Company B (the red graph) is cheapest when you drive more than 220 miles.
Company C (the green graph) is cheapest when you drive less than 20 miles.

Note: Find intervals when each line is below the other two.
You can find the intersection points with a grapher or algebraically.
To solve it with a grapher, see instructions in the *Study Tips and Resources* folder on Brightspace.

$$\begin{aligned} y_C &= y_A \\ 31 + 0.15x &= 33 + 0.05x \\ 0.10x &= 2 \\ x &= 20 \end{aligned}$$

$$\begin{aligned} y_A &= y_B \\ 33 + 0.05x &= 44 \\ 0.05x &= 11 \\ x &= 220 \end{aligned}$$

13. $\boldsymbol{d = 122 - 43t}$

14. In a college meal plan you pay a membership fee; then all your meals are at a fixed price per meal. Suppose 30 meals cost \$265 and 60 meals cost \$460.

a. Write a formula for the cost of a meal plan, C, in terms of the number of meals, n.
The change in C, $\Delta C = 460 - 265 = 195$.
The change in n, $\Delta n = 60 - 30 = 30$.
So the slope is $m = \dfrac{\Delta C}{\Delta n} = \dfrac{195}{30} = 6.5$.
To find the y-intercept, plug in a point: $n = 30,\ C = 265 \Rightarrow$

$$\begin{aligned} C &= 6.5n + b \\ 265 &= 6.5 \cdot 30 + b \\ 265 &= 195 + b \\ 70 &= b \end{aligned}$$

Ans: $\boldsymbol{C(n) = 70 + 6.5n}$

b. What is the price per meal? **\$6.50**

c. What is the membership fee? **\$70**