Name:

> Work in groups to answer as many problems as you can. Ask questions if you get stuck.

1. Find a linear model to represent the data for each of the following tables.

(a)

x	y
0	-10
1	-4
2	2
3	8

(d)

x	y
0	110
2	98
4	86
6	74

Answer:_____   Answer:_____

(b)

u	v
0	205
1	218
2	231
3	244

(e)

w	z
0	55
3	52
6	49
9	46

Answer:_____   Answer:_____

(c)

a	b
0	17
3	38
6	59
9	80

(f)

x	y
0	19
1.5	34
3	49
4.5	64

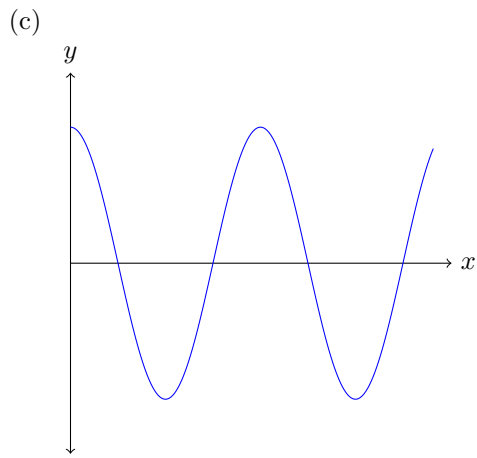Answer:_____   Answer:_____

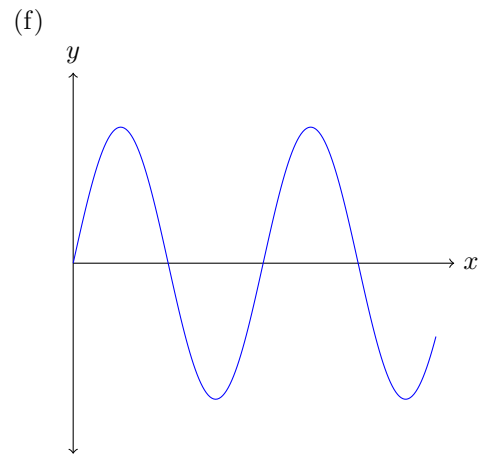2. Determine if the graphs below represent functions.
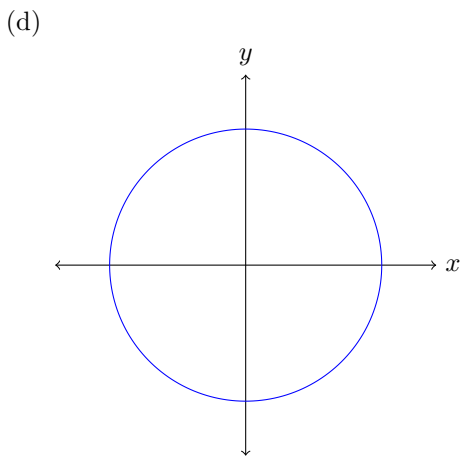
(a)

(b)

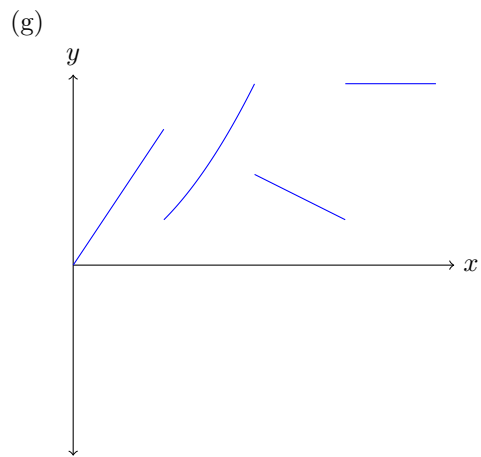Answer:_____   Answer:_____
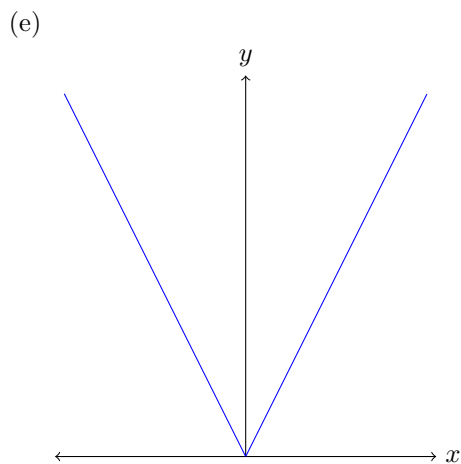
(c)

Answer:_____

(d)

Answer:_____

(e)

Answer:_____

(f)

Answer:_____

(g)

Answer:_____

(h)
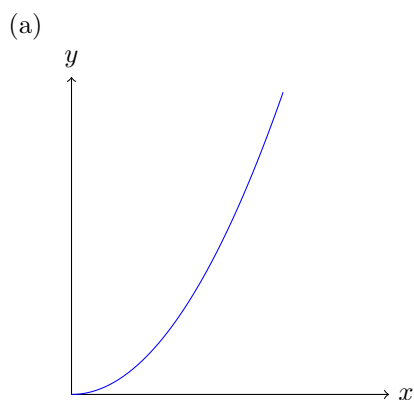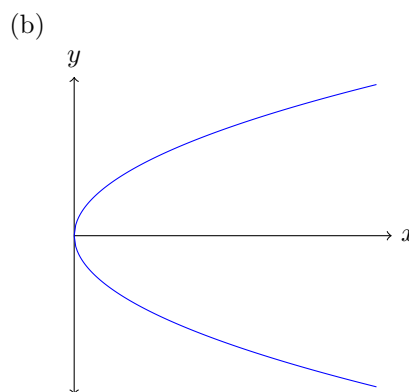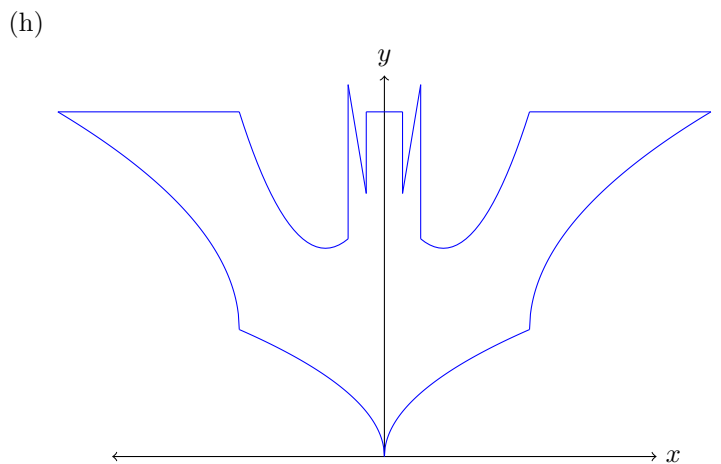
Answer:_____

3. Find the domain of the given function.

(a) $f(x) = 9 - x$

Answer:_____

(b) $P(z) = z^2 - 4$

Answer:_____

(c) $h(x) = \dfrac{2 + x}{8x - 1}$

Answer:_____

(d) $A(t) = \dfrac{t^2 - 4}{t^2 + 6t - 7}$

Answer:_____

(e) $h(w) = \dfrac{w^2 + 3w + 2}{w^2 + 12w + 36}$

Answer:_____

(f) $g(x) = \sqrt{10x - 15}$

Answer:_____

(g) $f(t) = \dfrac{10t}{\sqrt{6 - 4t}}$

Answer:_____

(h) $f(w) = \dfrac{\sqrt{w + 7}}{\sqrt{2 - w}}$

Answer:_____

(i) $A(z) = \sqrt{z^2 - 9z}$

Answer:_____

(j) $h(z) = \sqrt{z^2 - z - 20}$

Answer:_____

(k) $g(t) = \sqrt{\dfrac{6 + t}{5t - 10}}$

Answer:_____

(l) $g(t) = \sqrt{\dfrac{6 + t}{10 - 5t}}$

Answer:_____

4. (a) An internet bookstore charges \$15 shipping for orders under \$100 but provides free shipping for orders of \$100 or more.

    i. Find a piecewise function C that represents the cost of an order based on the total price x of books purchased.

    ii. Find $C(75)$, $C(100)$ and $C(105)$.

Answer:⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽

Answer:⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽

Answer:⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽

(b) A hotel chain charges \$74 dollars per night for the first two nights and \$50 for each additional night.

    i. Express the total cost T as function of the number of nights x that a guest stays.

    ii. Find $T(2)$, $T(3)$ and $T(5)$.

Answer:⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽

Answer:⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽

Answer:⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽⎽

(c) In a certain state, the maximum speed permitted on freeways is 65mph, and the minimum is 40mph. The fine for violating these limits is \$15 for every mile above the speed limit or \$10 for every mile below the speed limit.

    i. Express the total cost of the fine F in terms of the driving speed x on the freeway.

    ii. Find $F(30)$, $F(50)$ and $F(75)$.

Answer:⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯

Answer:⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯

Answer:⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯

(d) A utility company chatdes a base rate of 10 cents per kilowatt hour (kWh) for the first $350kWh$ and 15 cents per kilowatt hour for all additional electricity usage.

    i. Express the amount E that the utility company charges when x kilowatt hours of electricity is used.

    ii. Find $E(300)$, $E(350)$ and $E(600)$.

Answer:⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯

Answer:⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯

Answer:⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯

(e) To discourage excessive water use, a city charges its residents \$0.008 per gallon for households that use less than $4,000$ gallons a month and \$0.012 for households that use $4,000$ gallons or more.

     i. Find a piecewise function C that gives the water bill for a household using x gallons of water.

     ii. Find $C(3,900)$ and $C(4,200)$.

Answer:＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

Answer:＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

(f) In a certain country, income tax T is assessed based on a persons total income (in dollars). A person is charged as follows;

- If the persons income is \$10,000 or less, no tax is charged.
- If the person earns more than \$10,000 but no more than \$20,000, they are charged 8% of their total income.
- If the person earns more than \$20,000, they are charged the same %8 on anything up to \$20,000 and a further 15% on anything over $20,000$.

     i. Find a piecewise function T that represents the tax paid by a person earning x dollars.

     ii. Find $T(5,000)$, $T(12,000)$ and $T(25,000)$.

Answer:＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

Answer:＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

Answer:＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

The End.