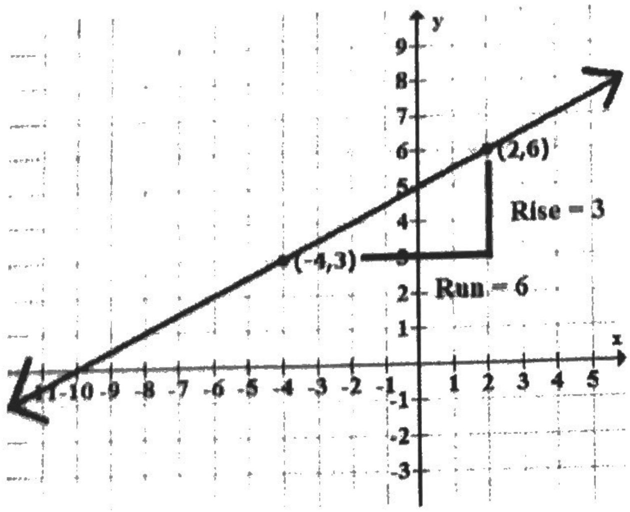
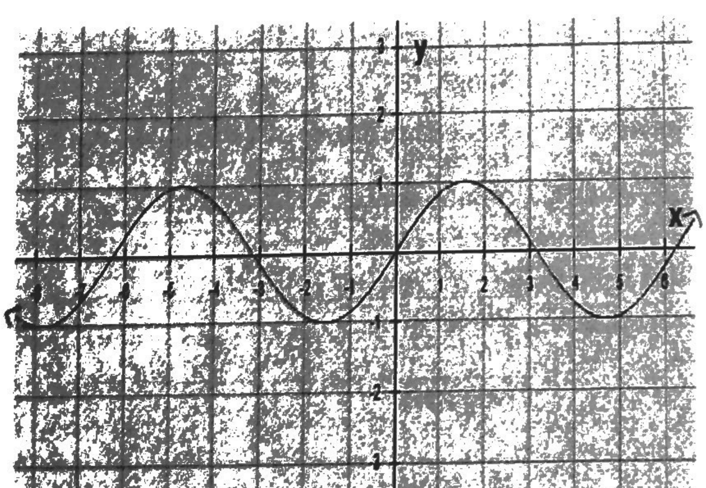
1.



Domain	$\mathbb{R}$ or $]-\infty, +\infty[$
Range	$\mathbb{R}$ or $]-\infty, +\infty[$
Zeros (x-intercepts)	-10
Y-Intercept	5
Positive	$[-10, +\infty[$
Negative	$]-\infty, -10]$
Increasing	$\mathbb{R}$ or $]-\infty, +\infty[$
Decreasing	$\varnothing$ never.
Maximum	$\varnothing$ keeps going.
Minimum	$\varnothing$ keeps going.

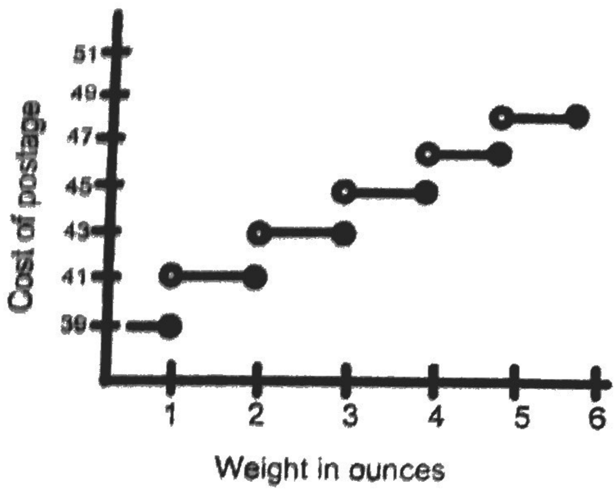
2.



Domain	$\mathbb{R}$ or $]-\infty, +\infty[$
Range	$[-1, 1]$
Zeros (x-intercepts)	List all visible zeros $-8, -3, 0, 3, 8$
Y-Intercept	0
Positive	Give one interval $[0, 3]$
Negative	Give one interval $[-3, 0]$
Increasing	Give one interval $[-8, -5]$
Decreasing	Give one interval $[-5, -2]$
Maximum	1
Minimum	-1

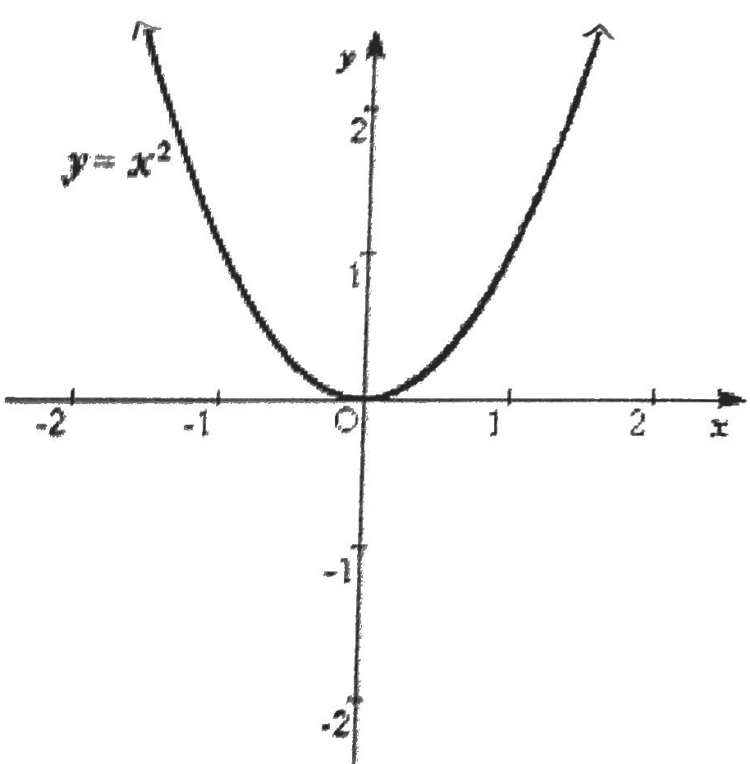
3.

The Cost of Postage for a Letter



Domain	[0, 6]
Range	[39, 48]
Zeros (x-intercepts)	Ø
Y-Intercept	39
Positive	]0, 6]
Negative	Ø
Increasing	]0, 6]
Decreasing	Ø
Maximum	48
Minimum	39

4.

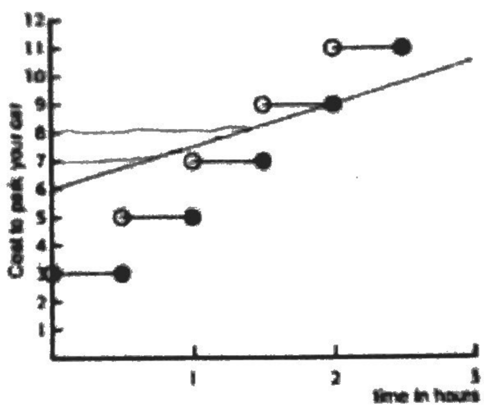


Domain	ℝ or]-∞, +∞[
Range	[0, +∞[
Zeros (x-intercepts)	0
Y-Intercept	0
Positive	]-∞, +∞[or ℝ
Negative	Ø
Increasing	[0, +∞[
Decreasing	]-∞, 0]
Maximum	Ø

Step Function:

1) In the problem below, at what point does the linear function become a better deal?

Easy Step Parking is represented by steps below while Straight Park is represented by a straight line. Describe what factors would influence your decision to park at either of these.



2) How much does a John pay if he parks for 30 minutes?

a) At Easy Step Parking 3 $

b) At Straight Parking 7 $

3) How much does Lisa pay if she parks for 90 minutes?

a) At Easy Step Parking 7 $

b) At Straight Parking 8 $

4) If Tom pays $5 to Easy Step Parking, what is the maximum amount of time he parked

1h00.

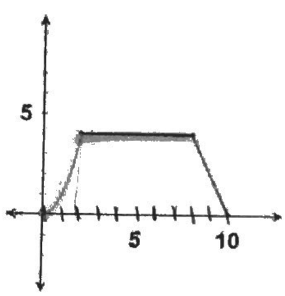
5) If Sofia pays $7 to Easy Step Parking, what is the minimum amount of time she parked?

1h30.

The Piecewise Function

Below is a piecewise function. It has 3 rules depending on the domain (the x values)

Piecewise Functions



$$f(x) = \begin{cases} x^2 & \text{if } 0 \le x < 2 \\ 4 & \text{if } 2 < x \le 8 \\ -2x+20 & \text{if } 8 < x \le 10 \end{cases}$$

Choose 3 highlighters.

Highlight the 3 different parts of the function in different colours and highlight the corresponding domain (interval) in the same colour.

You might be asked to find the value of y when x = 3 for example.

a) Find *f(3)*: *f(3)* = 4

1) Find the interval which includes 3.
2) Use the rule associated with this interval : y = 4
3) Plug in the x value (if needed) and solve.

   In this case the rule is a constant function (y=4 when x is between 2 and 8 (including 8))

b) Find *f(9)*: *f(9)* = 2

1. which interval:
2. Which rule:
3. Plug in 9 and solve

$-2(9) + 20$

$-18 + 20 = 2$

c) Find *f(0.5)*: *f(0.5)* = 0.25

$0.5^2 = 0.25$

Example: A Doctor's fee is based on the length of time.

- Up to 6 minutes costs $50
- Over 6 to 15 minutes costs $80
- Over 15 minutes costs $80 plus $5 per minute above 15 minutes

Which we can write like this:

$$f(t) = \begin{cases} \$50 & \text{if } t \le 6 \\ \$80 & \text{if } t > 6 \text{ and } t \le 15 \\ \$80 + \$5(t-15) & \text{if } t > 15 \end{cases}$$

If you were there for 12 minutes what would the fee be?

$\boxed{80\$}$

If you were there for 5 minutes what would the fee be?

$\boxed{50\$}$

If you were there for 30 minutes?

$\$80 + \$5(30-15) \quad \$80 + \$5 \cdot 15 \quad 80 + 75 = \boxed{155\$}$

If you were there for 1 hour?

$\$80 + \$5(60-15) \quad \$80 + \$5 \cdot 45 \quad 80 + 225 = \boxed{305\$}$

Solve the following problems

1. Determine *f(10)*

$-5+10=\boxed{5}$

$$f(x)=\begin{cases} x+4 & \text{if } x<1 \\ 2 & \text{if } 1\le x<4 \\ -5+x & \text{if } x\ge 4 \end{cases}$$

2. Determine *f(0)*

$0+4=\boxed{4}$

$$f(x)=\begin{cases} x+4 & \text{if } x<1 \\ 2 & \text{if } 1\le x<4 \\ -5+x & \text{if } x\ge 4 \end{cases}$$

3. Determine *f(3)*

$=\boxed{2}$

$$f(x)=\begin{cases} x+4 & \text{if } x<1 \\ 2 & \text{if } 1\le x<4 \\ -5+x & \text{if } x\ge 4 \end{cases}$$

4. Determine *f(8)*

$\frac{1}{2}\cdot 8-2$

$4-2=\boxed{2}$

$$f(x)=\begin{cases} -2x+8 & \text{if } x\le 4 \\ \frac{1}{2}x-2 & \text{if } x>4 \end{cases}$$

5. Determine *f(-2)*

$-2\cdot -2+8$

$4+8=\boxed{12}$

$$f(x)=\begin{cases} -2x+8 & \text{if } x\le 4 \\ \frac{1}{2}x-2 & \text{if } x>4 \end{cases}$$

6. Determine *f(4)*

$-2(4)+8=\boxed{0}$

$$f(x)=\begin{cases} -2x+8 & \text{if } x\le 4 \\ \frac{1}{2}x-2 & \text{if } x>4 \end{cases}$$

7. Determine *f(9)*

$f(9)=\boxed{9}$

$$f(x)=\begin{cases} -2x-4 & \text{if } x<-2 \\ x^2-2 & \text{if } -2\le x<1 \\ 2 & \text{if } x\ge 1 \end{cases}$$

8. Determine *f(-1)*

$-1^2-2=\boxed{-1}$

$$f(x)=\begin{cases} -2x-4 & \text{if } x<-2 \\ x^2-2 & \text{if } -2\le x<1 \\ 2 & \text{if } x\ge 1 \end{cases}$$

9. Determine *f(-2)*

$-2^2-2=\boxed{2}$

$$f(x)=\begin{cases} -2x-4 & \text{if } x<-2 \\ x^2-2 & \text{if } -2\le x<1 \\ 2 & \text{if } x\ge 1 \end{cases}$$

10. *f(10)* = ______

$f(10)=\boxed{35}$

$$f(x)=\begin{cases} 35 & \text{if } 0<x\le 15 \\ 40 & \text{if } 15<x\le 40 \\ 40+2(x-40) & \text{if } x>40 \end{cases}$$

11. *f(40)*= ______

$f(40)=\boxed{40}$

$$f(x)=\begin{cases} 35 & \text{if } 0<x\le 15 \\ 40 & \text{if } 15<x\le 40 \\ 40+2(x-40) & \text{if } x>40 \end{cases}$$

12. *f(100)*= ______

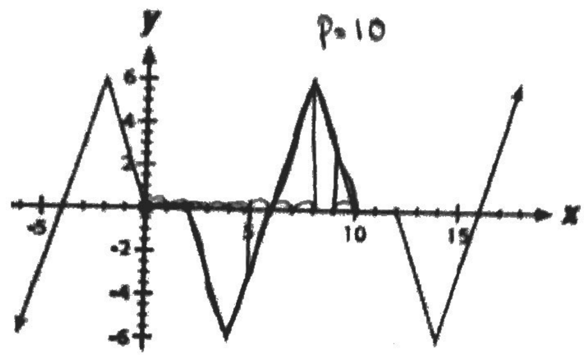
$40+2(100-40)$

$40+2\cdot 60$

$40+120=\boxed{160}$

$$f(x)=\begin{cases} 35 & \text{if } 0<x\le 15 \\ 40 & \text{if } 15<x\le 40 \\ 40+2(x-40) & \text{if } x>40 \end{cases}$$

Given the periodic function illustrated below, determine the value of $f(65)$.



Read as best as possible from the graph. A ruler might help.

1. $f(65) =$ -3
2. $f(20) =$ 0
3. $f(18) =$ 6
4. $f(-11) =$ 3

$\frac{65}{10} = 6 = 60$
x
v
5

$\frac{-11}{10} = 1 = 10$
x
v
1

$\frac{20}{10} = 2 = 20$
x
v
0

$\frac{18}{10} = 1 = 10$
x
v
8