FUNCTIONS 3

1. Draw the graph of the inversely proportional function $f(x) = \frac{18}{x}$

   a) Domain and Range
   b) Asymptotes
   c) Intervals of increasing
   d) Continuity
   e) Sketch the function $g(x) = \frac{18}{x} + 5$. Asymptotes?

2. Draw the graph of the inversely proportional function $f(x) = -\frac{4}{x}$

   a) Domain and Range
   b) Asymptotes
   c) Intervals of increasing
   d) Continuity
   e) Sketch the function $g(x) = -\frac{4}{x-2}$. Asymptotes?

3. A person purchases 20 chocolates at $5 each. With the same amount how many chocolates can be purchased at $10 each?

   a) Analyse and describe the type of relation cost per chocolates and the number of chocolates.
   b) Graph the function.

4. Graph the functions:

   a) $f(x) = 2^x + 3$ b) $g(x) = 2^{x-4}$

5. Graph the functions:

   a) $f(x) = \left(\frac{1}{3}\right)^x - 2$ b) $g(x) = \left(\frac{1}{3}\right)^{x+3}$

SOLUTION

1. Draw the graph of the inversely proportional function $f(x)=\frac{18}{x}$

It is a curve called hyperbola

a) Domain and Range $D(f)=\Re-\{0\}$

$R(f)=\Re-\{0\}$

b) Asymptotes: x-axe and y-axe

$(y=0 \text{ and } x=0)$

c) Intervals of increasing

Decrease $(-\infty,0)\cup(0,+\infty)$

d) Continuity: f is continuous in $\Re-\{0\}$

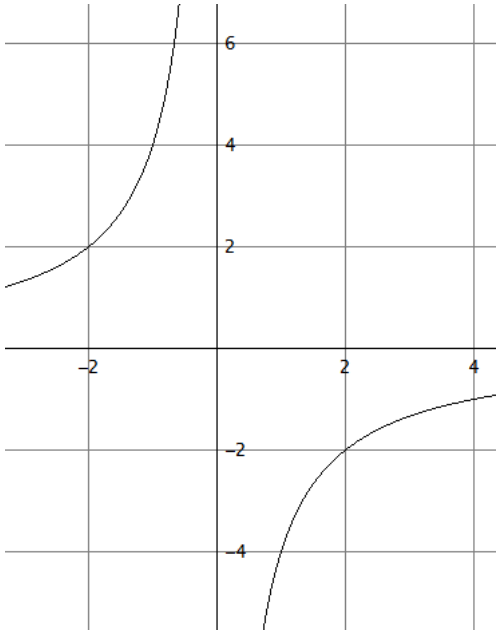
e) Sketch the function $g(x)=\frac{18}{x}+5$.

Asymptotes? $g(x)=f(x)+5$

It moves the graphs up the y-axis by the value of 5

Asymptotes: $y=5$ and $x=0$

2. Draw the graph of the inversely proportional function $f(x)=-\frac{4}{x}$



It is a curve called hyperbola

a) Domain and Range $D(f)=\Re-\{0\}$

$R(f)=\Re-\{0\}$

b) Asymptotes: x-axe and y-axe

$(y=0 \text{ and } x=0)$

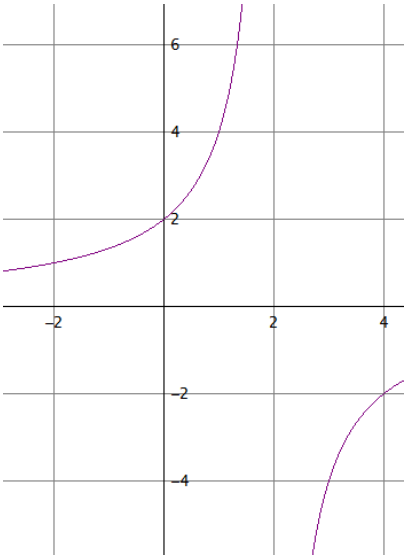
c) Intervals of increasing

Increase $(-\infty,0)\cup(0,+\infty)$

d) Continuity: f is continuous in $\Re-\{0\}$

e) Sketch the function $g(x) = -\dfrac{4}{x-2}$

$g(x) = f(x-2)$ moves the graphs 2 units to the right.
Asymptotes: $y = 0$ and $x = 2$

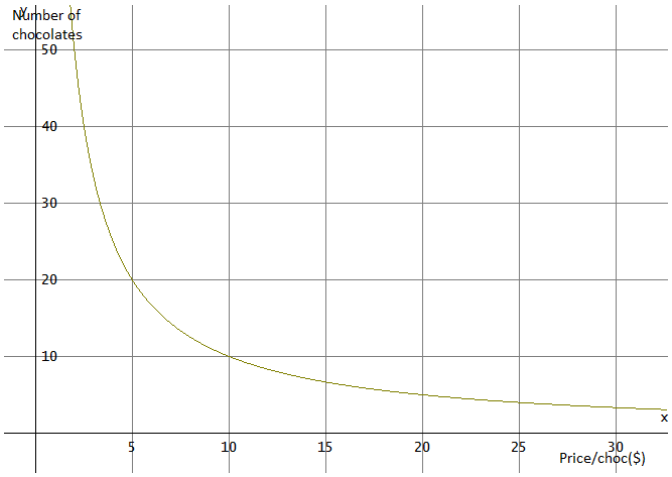


3. A person purchases 20 chocolates at $5 each. With the same amount how many chocolates can be purchased at $10 each? He can purchase 10 chocolates
a) Analyse and describe the type of relation cost per chocolates and the number of chocolates.

Cost/chocolate	1	2	4	5	10
Number of chocolates	100	50	25	20	10

It is a inverse proportion function, formula $y = \dfrac{100}{x}$

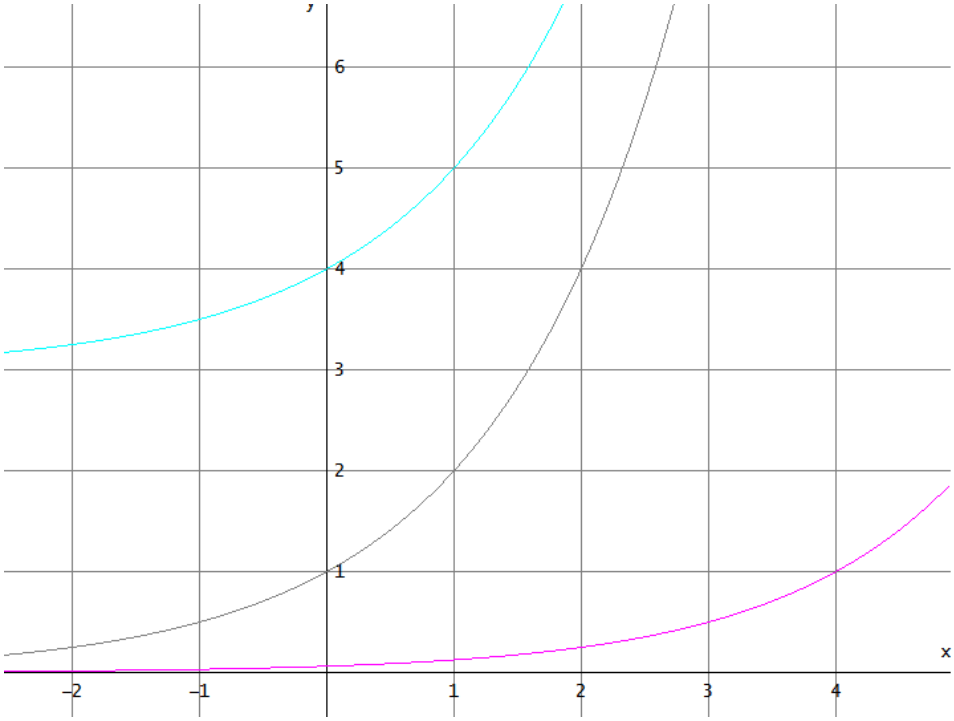
b) Graph the function.



4. Graph the functions:
a) $f(x) = 2^x + 3$ exponential function, the graph is as $f(x) = 2^x$, but it is up the y-axis by the value of 3 units

b) $g(x) = 2^{x-4}$ exponential function, the graph is as $f(x) = 2^x$, but it is 4 units to the right.

$f(x) = 2^x$ (black) ; $f(x) = 2^x + 3$ (blue); $g(x) = 2^{x-4}$ (purple)



5. Graph the functions:

a) $f(x)=\left(\frac{1}{3}\right)^x-2$ exponential function with base <1, the graph is as $f(x)=\left(\frac{1}{3}\right)^x$, but it is down the y-axis by the value of 2 units

b) $g(x)=\left(\frac{1}{3}\right)^{x+3}$ exponential function with base <1, the graph is as $f(x)=\left(\frac{1}{3}\right)^x$, but it is 3 units to the left.

$f(x)=\left(\frac{1}{3}\right)^x$ (red); $f(x)=\left(\frac{1}{3}\right)^x-2$ (blue); $g(x)=\left(\frac{1}{3}\right)^{x+3}$ (green)