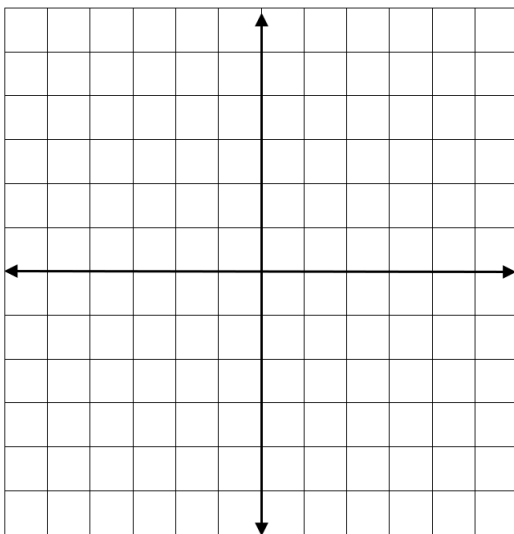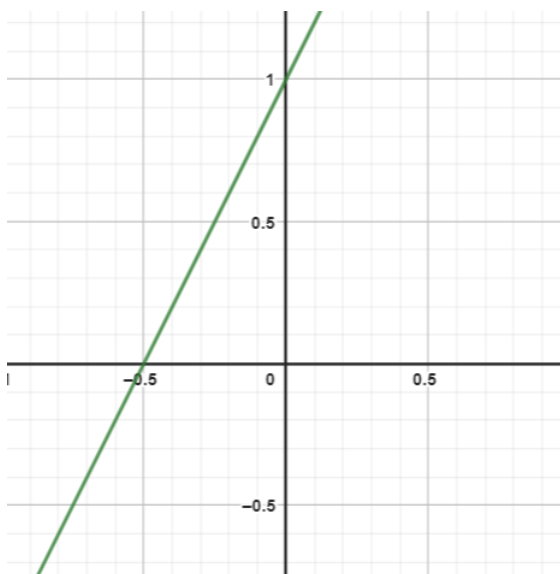## Linear function

1. Draw a rough sketch of the following: $y = mx + c$ where $m < 0; c = 0$

2. Sketch the graph: $y = -2x - 4$

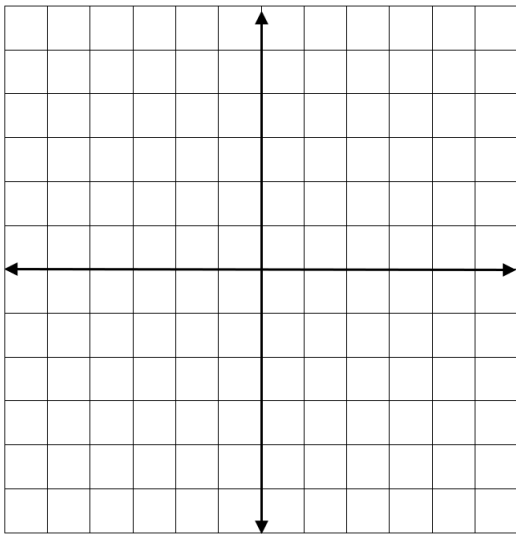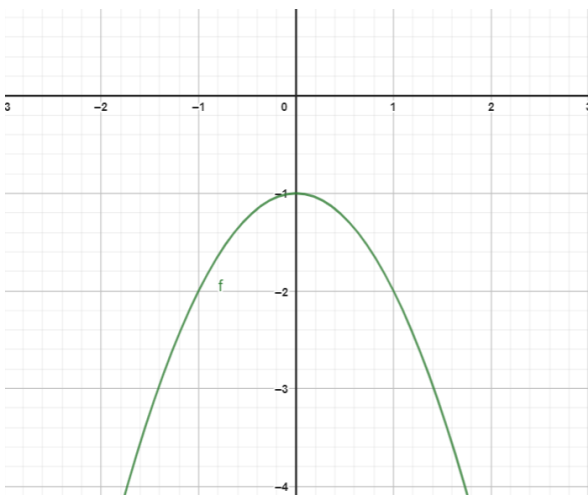3. Find the equation of the following function:

Parabola

1. Draw a rough sketch of the following: $g(x) = ax^2 + q$ where $a < 0; q > 0$

2. Sketch the graphs: $y = 2x^2 - 8$

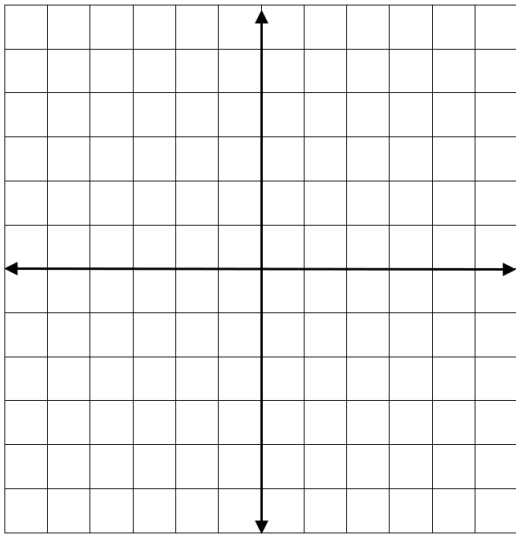3. Find the equation of the following:

4. Write down the domain and range of the graphs 2 and 3.

Hyperbola

1. Draw a rough sketch of the following: $y = \frac{a}{x} + q$ where $a > 0; q < 0$

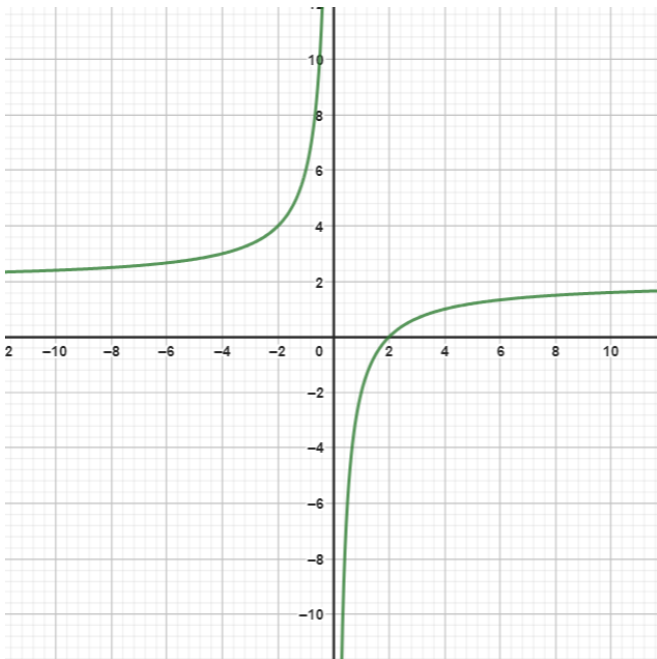2.1 Sketch the graph of $y = \frac{6}{x} - 1$.

2.2 Write down the equation of the asymptote(s).

2.3 Give both axes of symmetry.

2.4 Calculate the *x*- intercept.

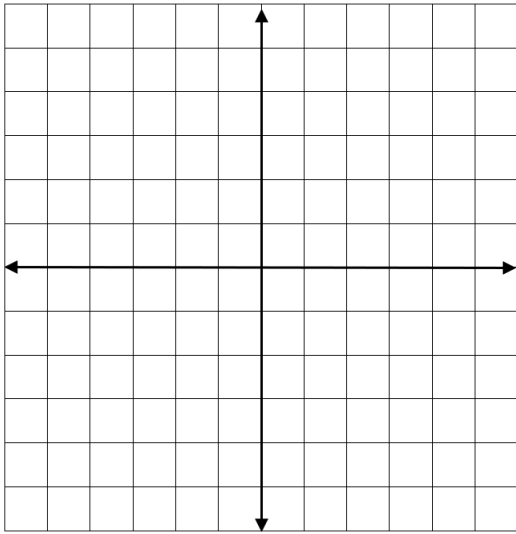3. Find the equation of the following function:
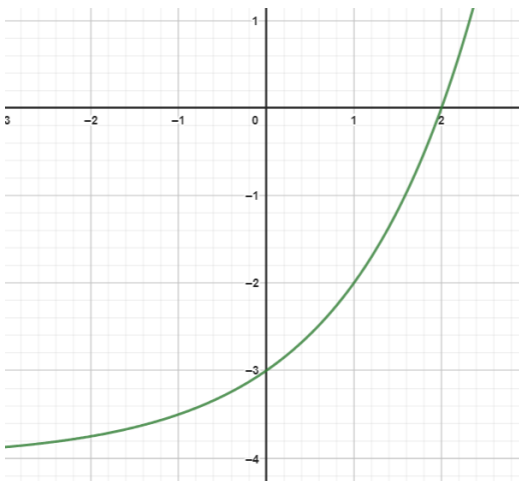

5. Write down the domain and range of the graph in 2 and 3.

Exponential

1. Draw a rough sketch of the following: $y = a.b^x + q$ where $a < 0; 0 < b < 1; q < 0$

2. Sketch the graph of $y = 2.(\frac{1}{3})^x - 1$.

3. Find the equation of the following function:

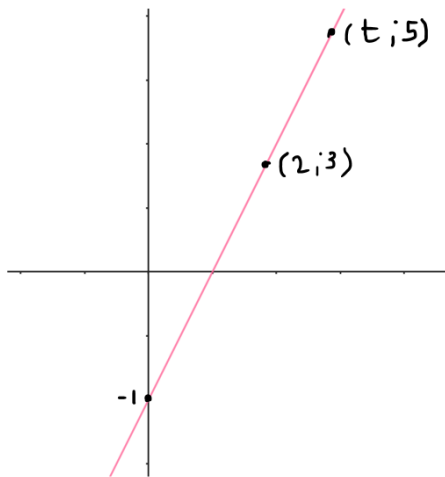4. Write down the domain and range of the graph in 2 and 3.

Mixed examples

1. Show that the following two lines are parallel:

$$y = 2x - 4 \quad \text{and} \quad 2y - 4x = 6$$

2. Use the graph in the diagram below to answer questions:

2.1 Give the coordinates of the y-intercept.
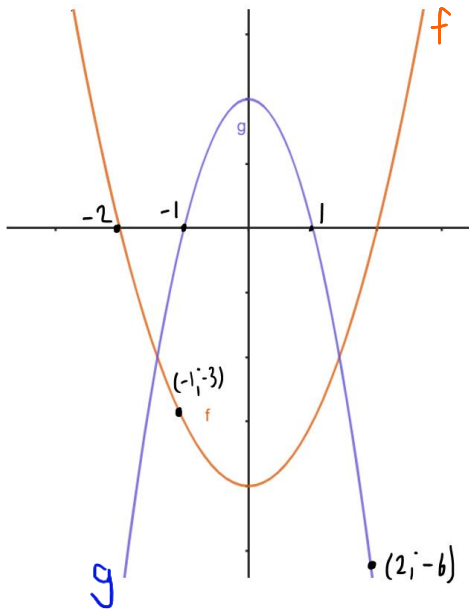
2.2 Calculate the gradient.

2.3 Write the equation of the graph in the form of $f(x) = mx + c.$

2.4 What is the value of **t**?
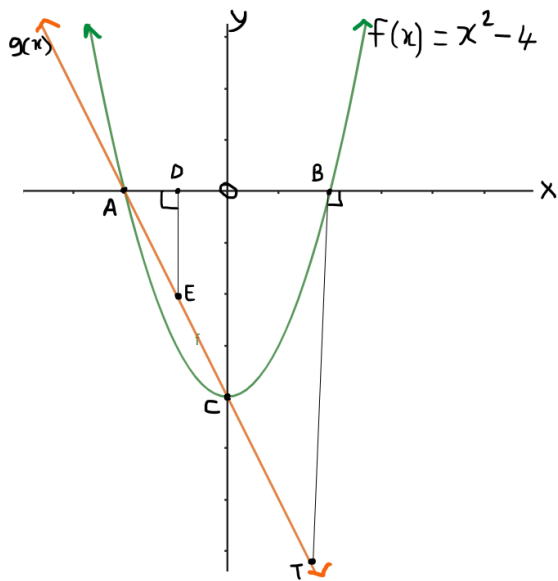
2.5 Find the value of $3f(2) - 4f(-1).$

3. Study the graphs below and answer the following questions:

3.1 Find the equations of the parabolas.

3. 2 Find where $f(x) = g(x)$.

4. Study the graphs below and answer the following questions:

$g(x)$

$f(x) = x^2 - 4$

Determine:

4.1 the lengths of OA, OB and OC.
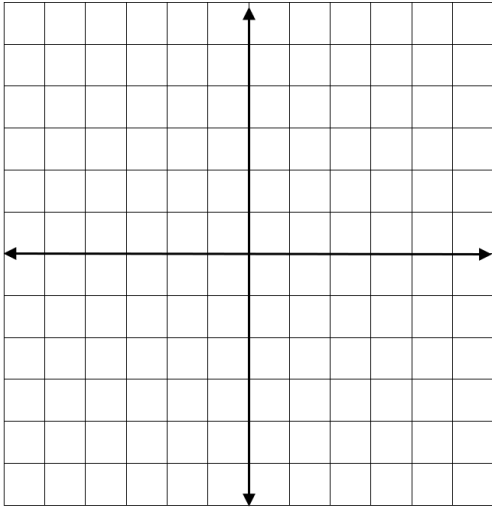
4.2 the equation of AC.

4.3 the length of BT.

4.4 the length of DE if OD = 1.

5. Given: $f(x) = -x^2 + 4$ and $g(x) = 2x + 4$.

5.1 Sketch f and g on the same set of axes.

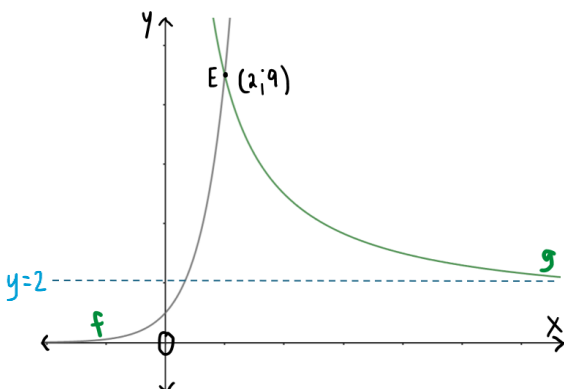5.2 Use the graph to solve for x where:

a) $f(x) = g(x)$

b) $f(x) \cdot g(x) > 0$

5.3 Describe the transformation of $f(x)$ to $h(x) = -x^2 - 6$

5.4   Write down the equation of the reflection of $f(x)$ about the x axis.

6. The diagram below shows the graphs of $f(x) = 3^x$ and $g(x) = \frac{a}{x} + q$ (x > 0).
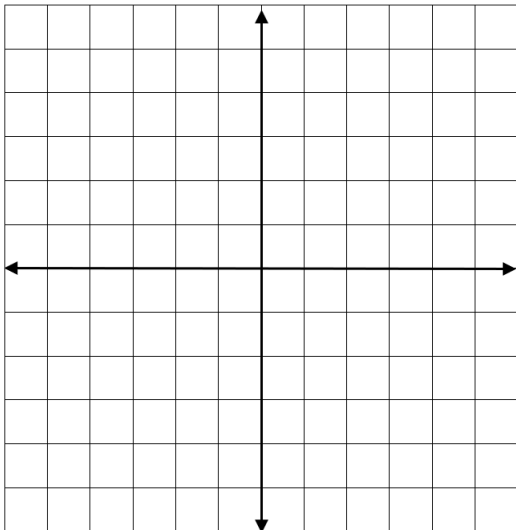The point E (2;9) lies on the graphs of f **and** g.

6.1 Determine the values of a and q.

6.2 For which values of x is $f(x) < g(x)$?

6.3 Calculate the value(s) of x for which $3.f(x) = 9$.

7. Sketch the graphs of $f(x) = 2^x + 1$ and $g(x) = 3x^2 - 12$ on the same set of axes. Clearly show the coordinates of the turning point and al intercepts with the axes.

7.1 Does the graph of $g(x) = 3x^2 - 12$ have a maximum- of minimum value? What is the value?

7.2 Use the graph to find the values for x where:

a) $g(x) > 0$.

b) $f(x) \leq 2$.

7.3 Give the equation of the reflection of f in the x-as.

8. The functions $f(x) = \frac{2}{x}$ and $g(x) = ax + q$ are shown below. If the distance between $f(x)$ and $g(x)$ is equal to 2 units where $x = 2$. Determine the equation of $g(x)$.