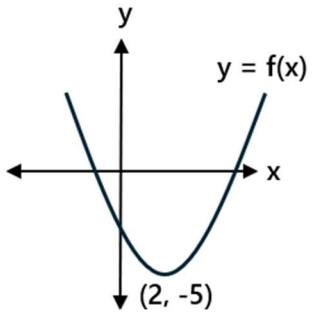
GRAPH TRANSFORMATIONS

1) The graph of $y = f(x)$ is shown below.

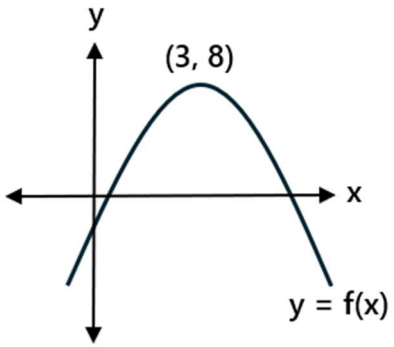
The coordinates of the minimum point on the curve are $(2, -5)$. State the coordinates of the turning point of the curve with equation:



a. $y = f(x + 2)$
b. $y = f(x) - 1$
c. $y = -f(x)$
d. $y = 2f(x)$

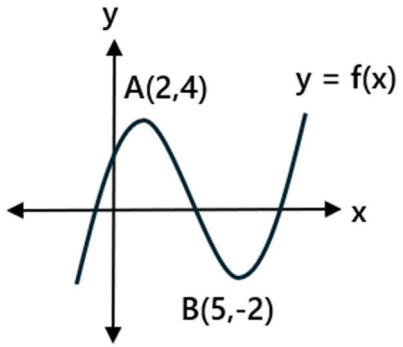
2) The graph of $y = f(x)$ is shown below.

The coordinates of the maximum point on the curve are $(3, 8)$. State the coordinates of the turning point of the curve with equation:



a. $y = f(x) + 4$
b. $y = f(x) - 3$
c. $y = f(3x)$
d. $y = f(x - 6)$

3) The graph of $y = f(x)$ is shown below.



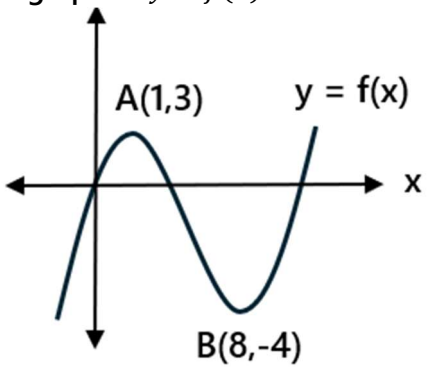
The coordinates of the maximum point on the curve are $(2, 4)$. State the coordinates of the maximum point of the curve with equation:

a. $y = -f(x)$
b. $y = f(x) + 10$
c. $y = f(-x)$
d. $y = f\left(\frac{1}{4}x\right)$

The coordinates of the minimum point on the curve are $(5, -2)$. State the coordinates of the minimum point of the curve with equation:

e. $y = f(x + 4)$
f. $y = f(x - 3)$
g. $y = 5f(x)$
h. $y = f(2x)$

4) The graph of $y = f(x)$ is shown below.



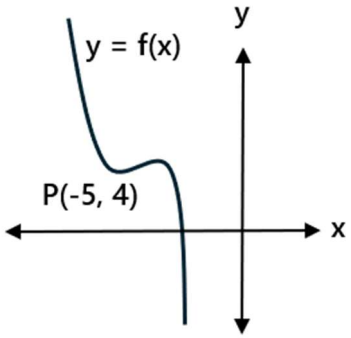
The curve passes through the point $A(1,3)$. State the coordinates of the point A on the graph of:

a. $y = f(x) + 4$
b. $y = f(x) - 3$

The curve passes through the point $B(8,-4)$. State the coordinates of the point B on the graph of:

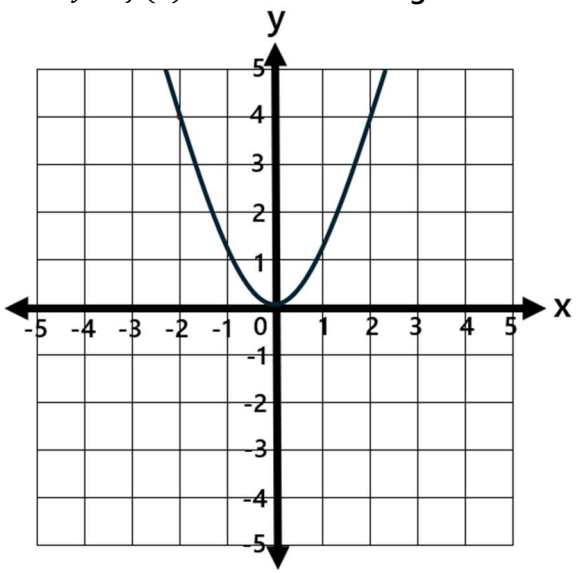
c. $y = f(4x)$
d. $y = f(x - 6)$

5) A point $P(-5,4)$ is shown on the curve $y = f(x)$ below. Write down the equation that would map P to:



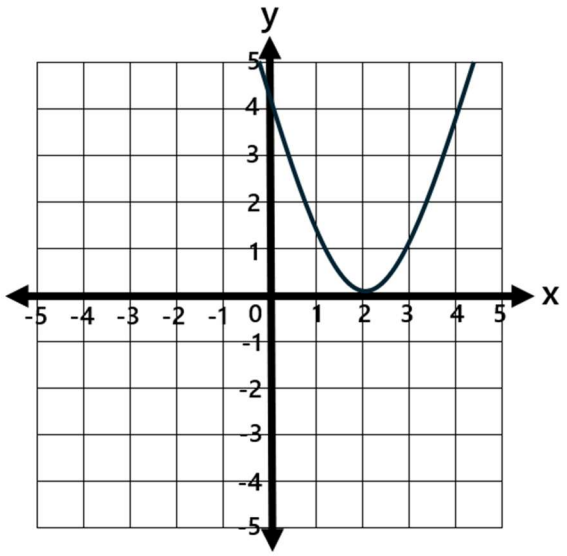
a. $(-5,-1)$
b. $(-1,4)$
c. $(0,4)$
d. $(-5,8)$

6) The graph of $y = f(x)$ is shown on the grid.



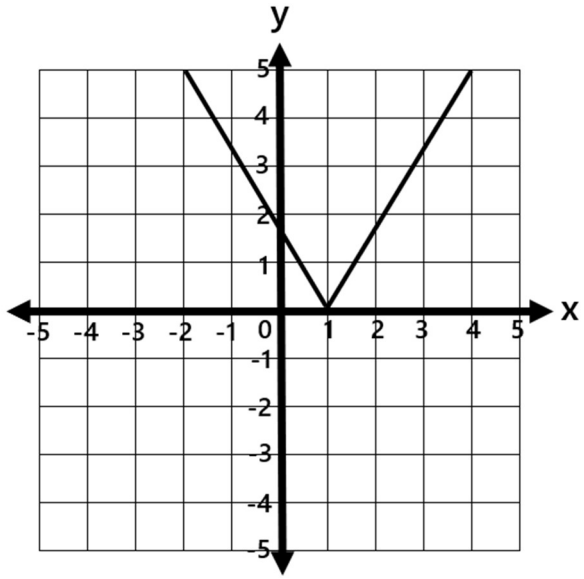
Use the grid to sketch the graph of $y = -f(x)$.

7) The graph of $y = f(x)$ is shown on the grid.



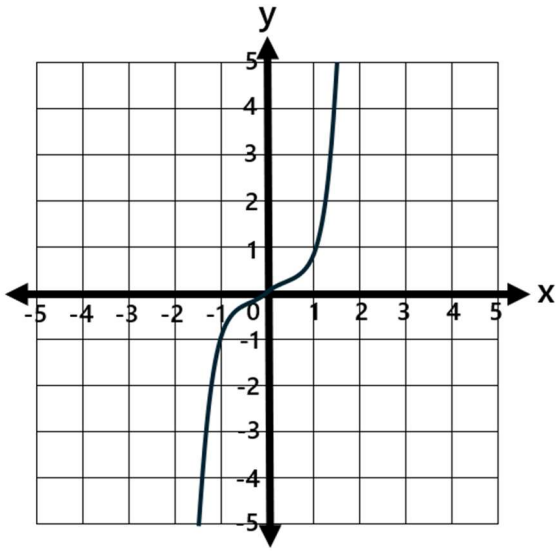
Use the grid to sketch the graph of $y = f(-x)$.

8) The graph of $y = f(x)$ is shown on the grid.



Use the grid to sketch the graph of $y = f(x) - 4$.

9) The graph of $y = f(x)$ is shown on the grid.



Use the grid to sketch the graph of $y = f(x - 3)$.

10) Describe the transformation from $y = f(x)$ to:

a. $y = f(x) + 3$

b. $y = f(x - 5)$

c. $y = -f(x)$

d. $y = f(-x)$

e. $y = 3f(x)$

f. $y = f\left(\frac{1}{3}x\right)$

g. $y = f(2x)$

h. $y = f(x) - 7$

11) A student says:

$$y = f(x - 4)$$

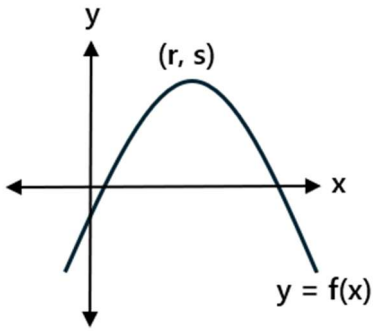
means "translate the graph 4 units left." Is the student correct? Give a reason for your answer.

12) A point (5, 7) lies on the graph of $y = f(x)$.
Find the coordinates of the corresponding point on the graph of $y = f(x - 2) - 3$.

13) The graph of $y = f(x)$ is translated 5 units left and reflected in the x-axis.
Write the equation of the transformed graph.

Challenge

14) The graph of $y = f(x)$ is shown below.
The maximum point on the graph is (r, s).



Write down the coordinates of the turning point of $y = f(-x) + 3$.
Give your answer in terms of r and s.

15) The graph of $y = \frac{2}{x}$ is shown below. The graph undergoes a transformation of $y = f(x - 2) + 4$.
Draw a sketch of the transformed graph, labelling any new asymptotes. Then state the points of intersection with the axes.