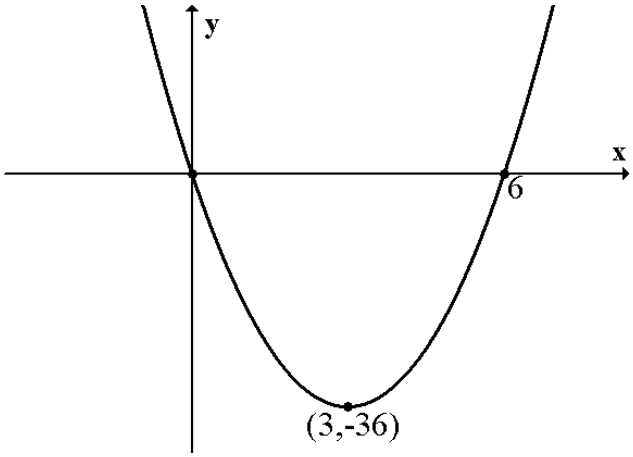
Functions from Graphs 2

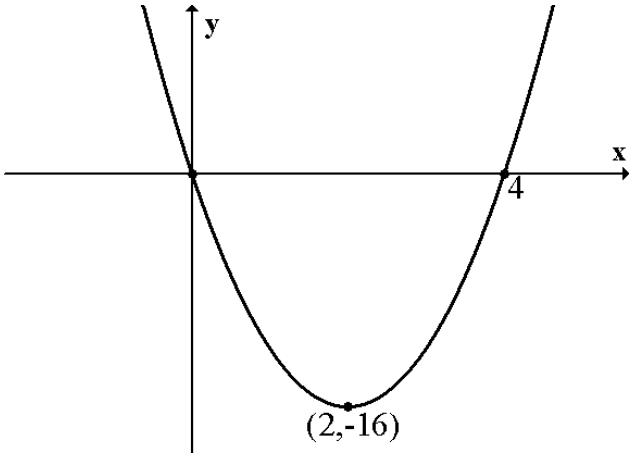
1. The diagram shows a parabola with equation $y = ax(x - b)$.

   Find the values of a and b.



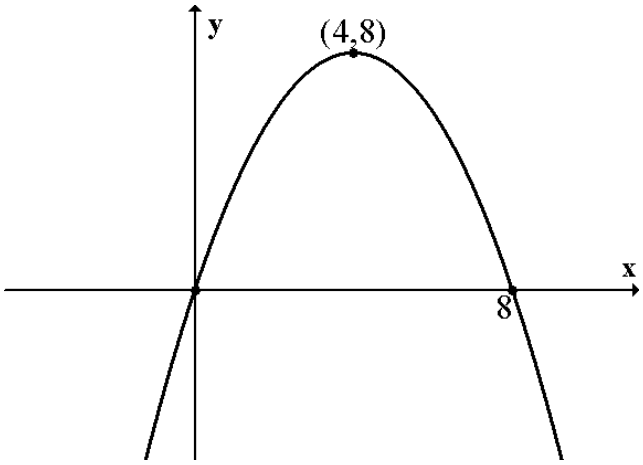
2. The diagram shows a parabola with equation $y = kx(x - b)$.

   Find the values of k and b.



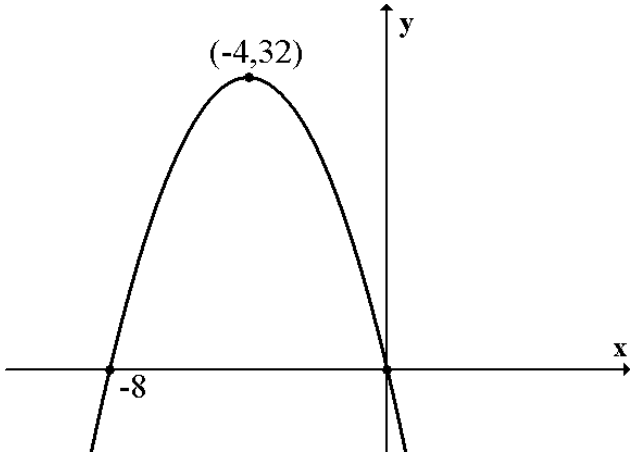
3. The diagram shows a parabola with equation $y = ax(x - b)$.

   Find the values of a and b.



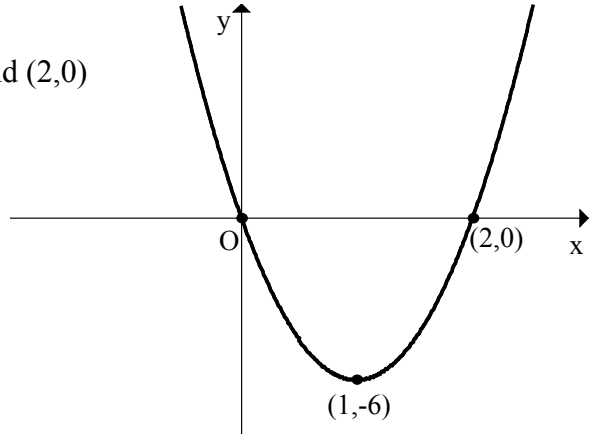
4. The diagram shows a parabola with equation $y = kx(x + b)$.

   Find the values of k and b.



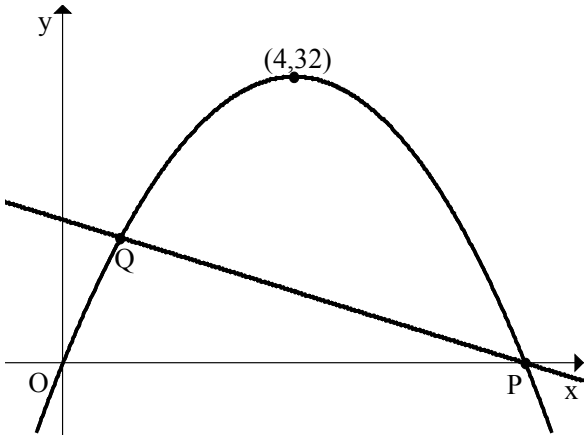
5. The parabola opposite crosses the x-axis at (0,0) and (2,0) and has a minimum turning point at (1,-6).

   Find the equation of this parabola.

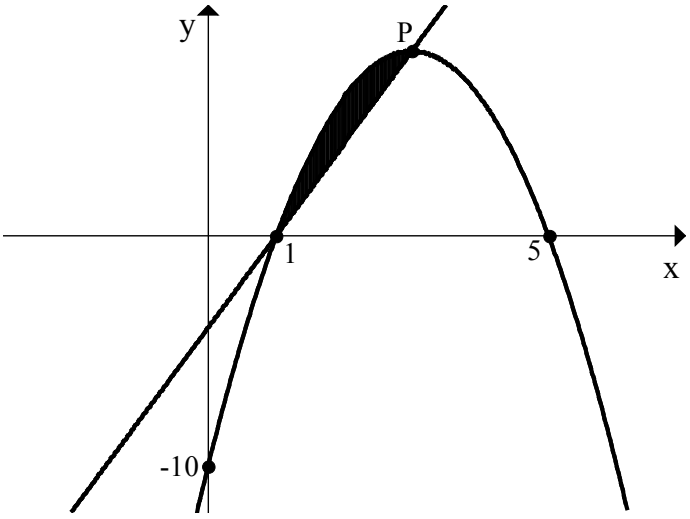


6. The parabola shown is of the form $y = ax(x - b)$. It has a maximum turning point of (4,32) and P is the point (8,0).

   (a) Find the equation of the parabola.
   (b) The line $y = -2x + 16$ intersects this parabola at P and Q. Find the coordinates of Q.

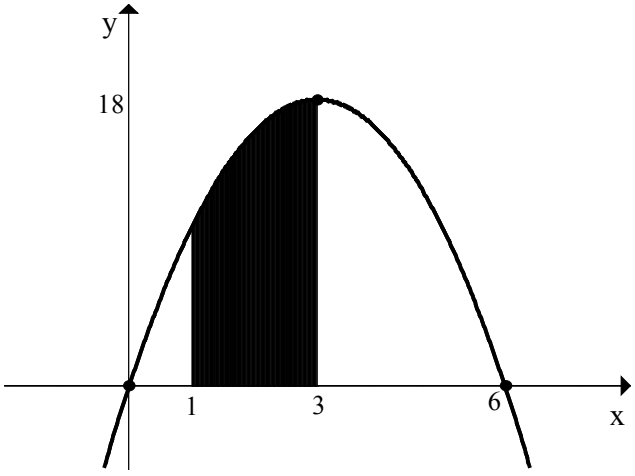


7. (a) Find the equation of the parabola, f(x), shown opposite.
   (b) Find the coordinates of P.
   (c) Hence calculate the shaded area.



8. The diagram shows the graph of $y = f(x)$. The graph is of the form $y = kx(x - b)$.

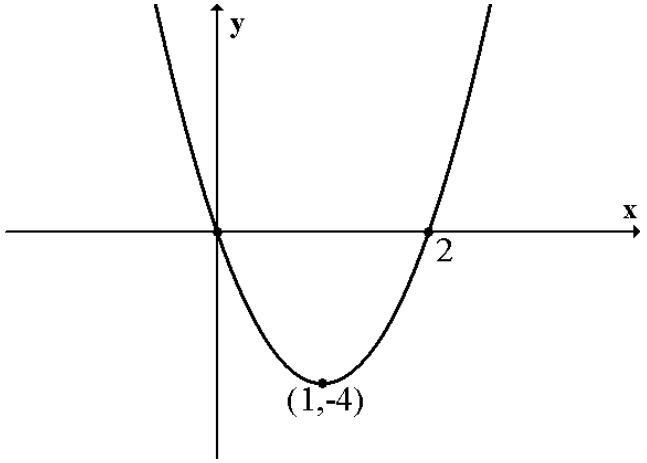
   (a) Find a formula for f(x).
   (b) Calculate the shaded area.



9. The diagram shows a parabola with equation $y = ax(x - b)$.

(a) Find the values of a and b.

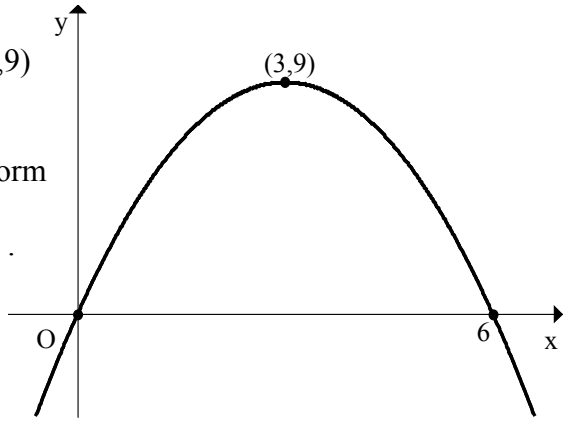
(b) $y = f'(x)$. Find a formula for f(x) given $f(3) = -4$.



10. A parabola passes through the points (0,0), (6,0) and (3,9) as shown.

(a) The equation of this parabola can be written in the form $y = ax(b - x)$. Find the values of a and b.

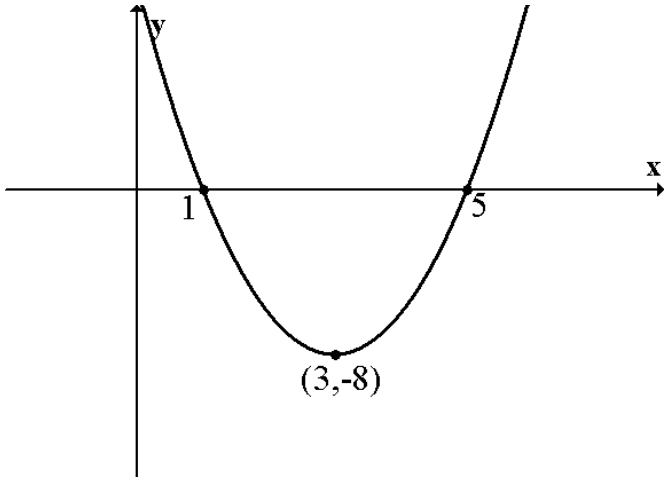
(b) The line $y = x + 4$ intersects this curve at two points . Find the coordinates of these points.



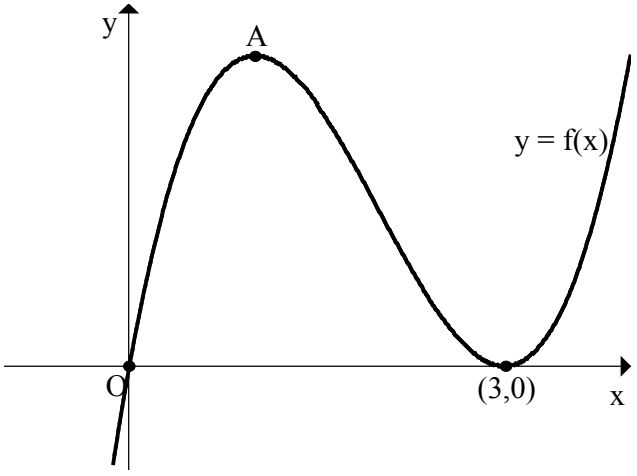
11. The diagram shows a parabola with equation $y = k(x - a)(x - b)$.

(a) Find the values of k, a and b.

(b) $y = f'(x)$. Find a formula for f(x) given $f(6) = -40$.

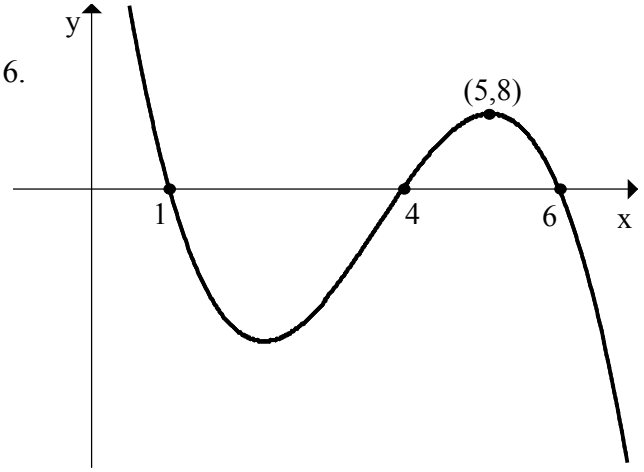


12. In the diagram A is the point (1,12). Find the equation of f(x).



13. The function shown has zeros at x = 1, 4, and 6.
It has a maximum turning point at (5,8).

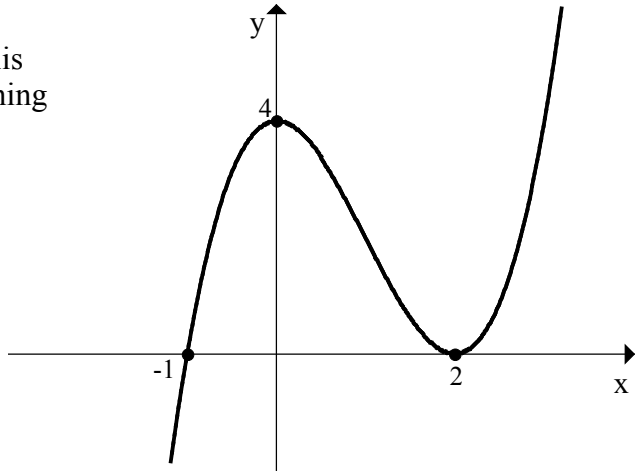
Find the equation of this cubic function.



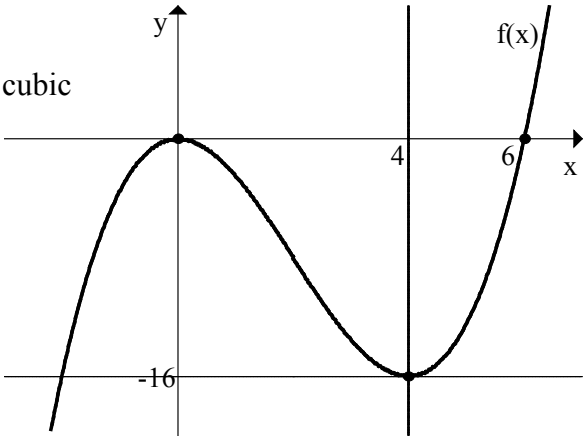
14. (a) The graph shown opposite crosses the x-axis at (-1,0) and (2,0) and has a maximum turning point of (0,4).
Find the equation of this graph.

(b) P is the point (3,14) and Q is (-1,-10).
Find the equation of the line PQ.

(c) The line PQ intersects the graph in (a) at 3 points. If one of these points is (4,20) find the other points of intersection.



15. The diagram opposite is a sketch of the graph of a cubic function y = f(x).
(a) If y = -16 is a tangent to the curve, find a formula for f(x).
(b) The line y = 12x – 32 crosses this curve at 3 points.
Find the coordinates of these points.



16. (a) The parabola opposite cuts the x-axis at -1 and p and the y-axis at -2p.
Show that the parabola has equation $y = 2x^2 + 2x(1 - p) - 2p$.

(b) The shaded area has a value equal to $\frac{-10p}{3}$.
Calculate the value of p.