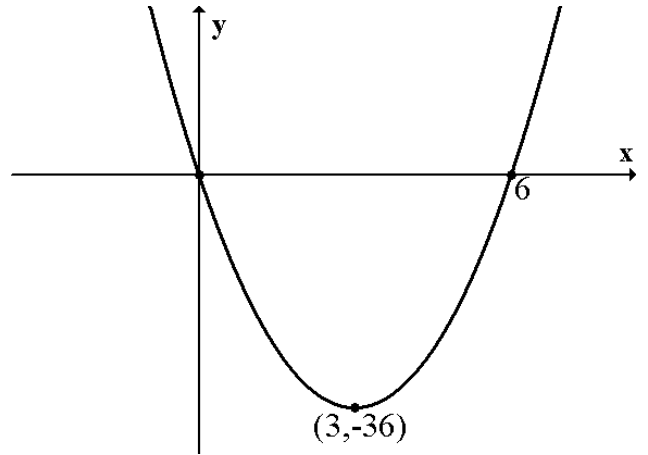


Functions from Graphs

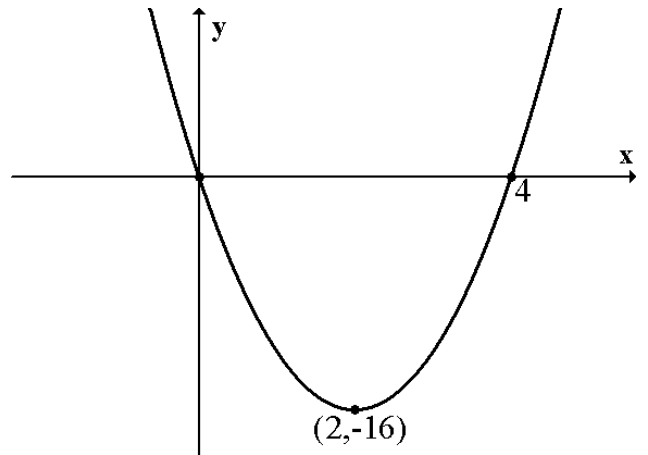
1. The diagram shows a parabola with equation $y = ax(x - b)$.

Find the values of a and b .



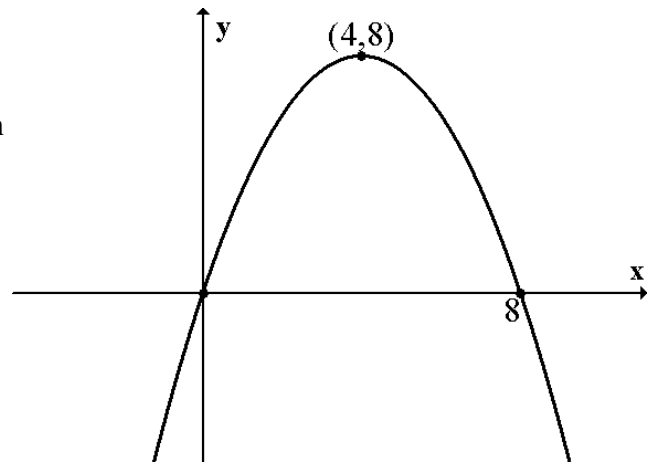
2. The diagram shows a parabola with equation $y = kx(x - b)$.

Find the values of k and b .



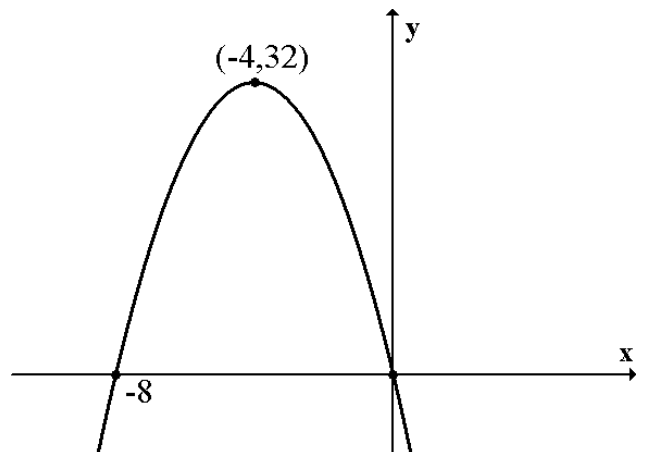
3. The diagram shows a parabola with equation $y = ax(x - b)$.

Find the values of a and b .



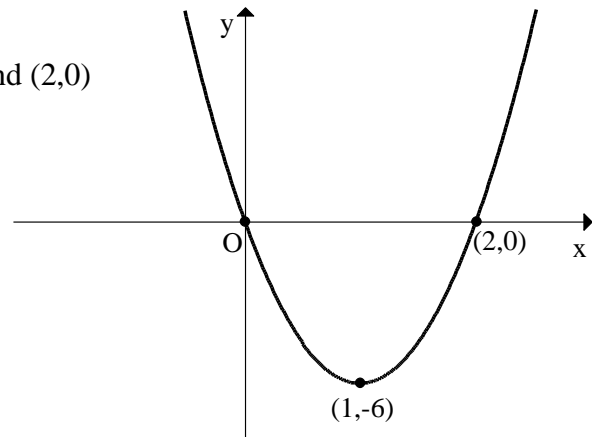
4. The diagram shows a parabola with equation $y = kx(x + b)$.

Find the values of k and b .



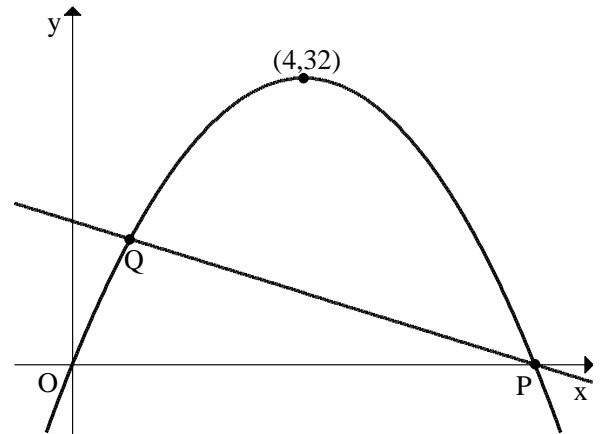
5. The parabola opposite crosses the x-axis at (0,0) and (2,0) and has a minimum turning point at (1,-6).

Find the equation of this parabola.

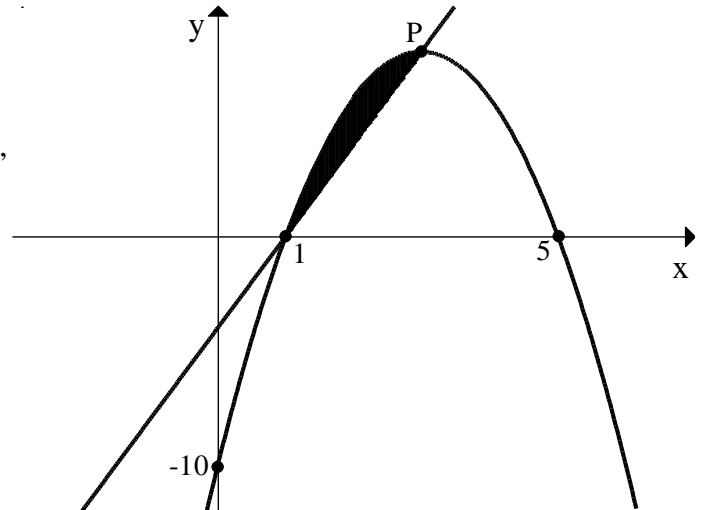


6. The parabola shown is of the form $y = ax(x - b)$. It has a maximum turning point of (4,32) and P is the point (8,0).

- (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.

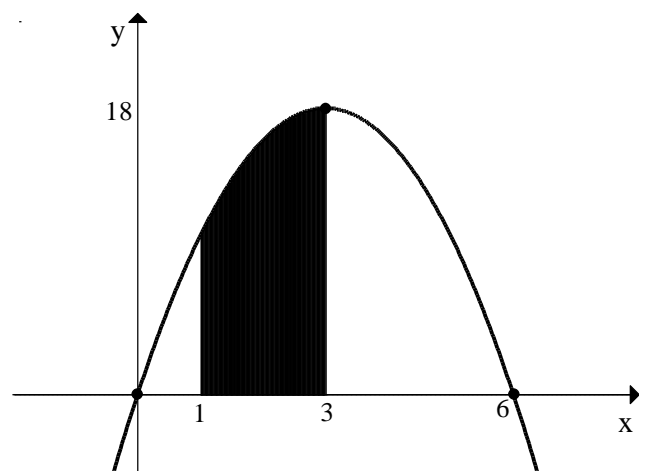


7. (a) Find the equation of the parabola, $f(x)$, shown opposite.
 (b) Find the coordinates of P.
 (c) Hence calculate the shaded area.



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

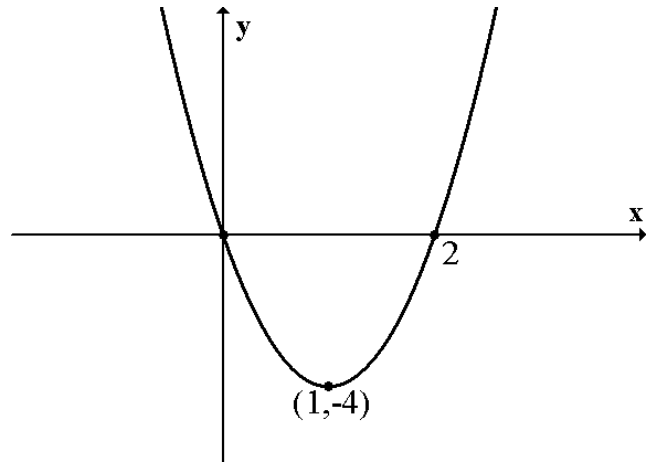
- (a) Find a formula for $f(x)$.
 (b) Calculate the shaded area.



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

(a) Find the values of a and b .

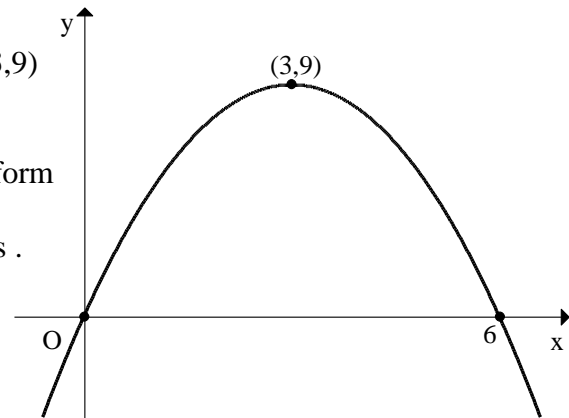
(b) $y = f'(x)$. Find a formula for $f(x)$ given $f(3) = -4$.



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 .

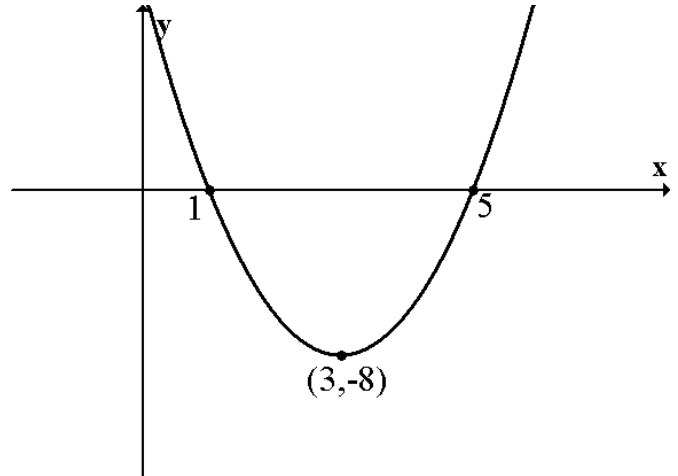
(b) The line $y = x + 4$ intersects this curve at two points. Find the coordinates of these points.



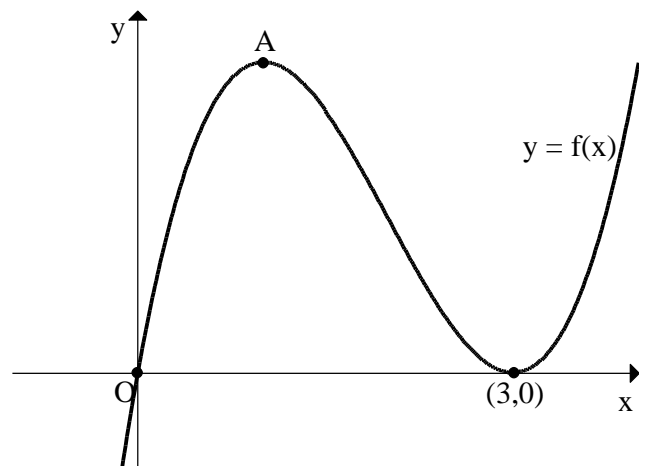
11. The diagram shows a parabola with equation $y = k(x - a)(x - b)$.

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

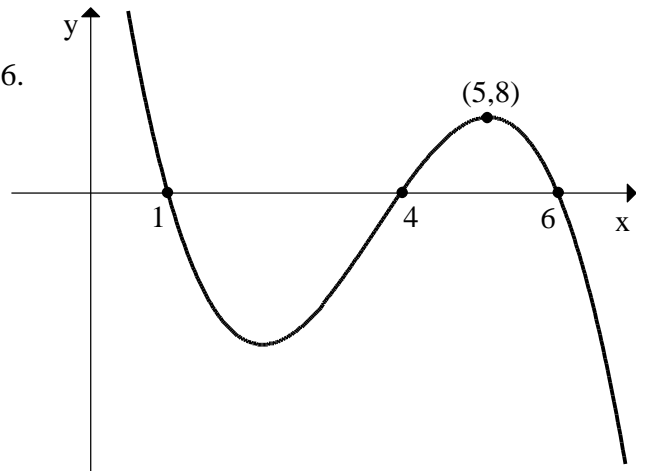
(b) $y = f'(x)$. Find a formula for $f(x)$ given $f(6) = -40$.



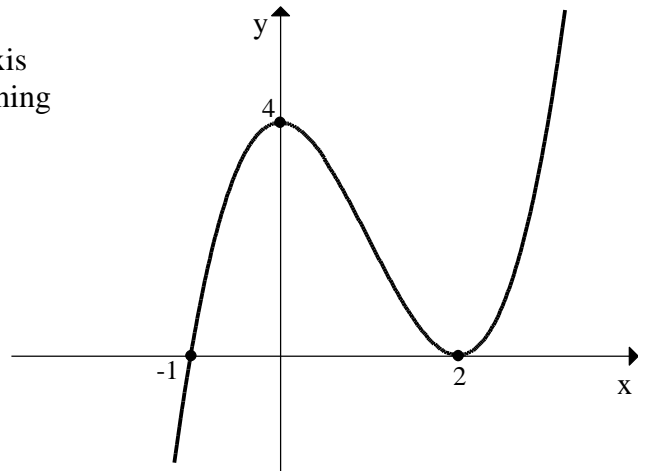
12. In the diagram A is the point $(1,12)$. Find the equation of $f(x)$.



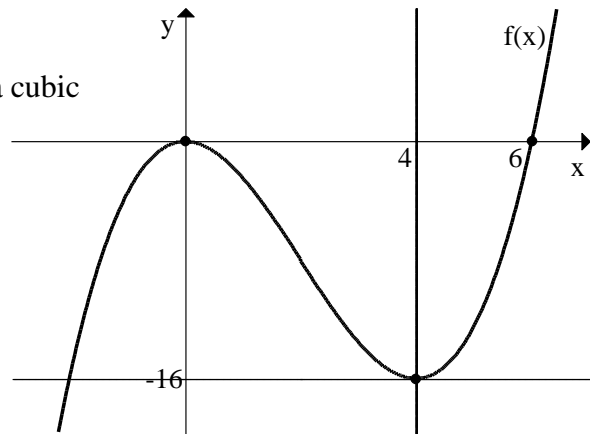
13. The function shown has zeros at $x = 1, 4,$ and 6 .
It has a maximum turning point at $(5,8)$.
- Find the equation of this cubic function.



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 .

