

PreCalculus Quadratic Functions and Equations Review

1. Write each of these quadratic functions in the form $f(x) = a(x - h)^2 + k$ (completed square form)

$$f(x) = x^2 + 8x - 3$$

$$f(x) = x^2 - 5x + 4$$

$$f(x) = 2x^2 + 6x + 5$$

$$f(x) = x^2 - 2x + 7$$

$$f(x) = x^2 + 7x - 2$$

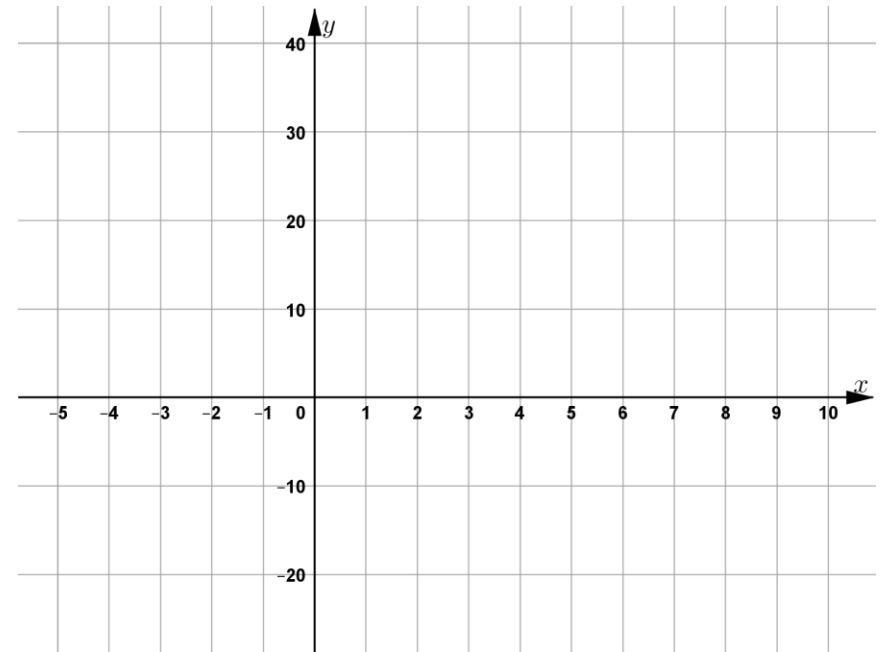
$$f(x) = 3x^2 - 5x - 4$$

2. Write each of these quadratic functions in factored form:

$f(x) = x^2 - 13x + 30$	$f(x) = 3x^2 + x - 2$
$f(x) = x^2 + 18x + 77$	$f(x) = 5x^2 - 13x - 6$
$f(x) = x^2 - 8x$	$f(x) = 4x^2 - 2x - 2$
$f(x) = 4x^2 - 16$	$f(x) = 10x^2 + 21x + 2$

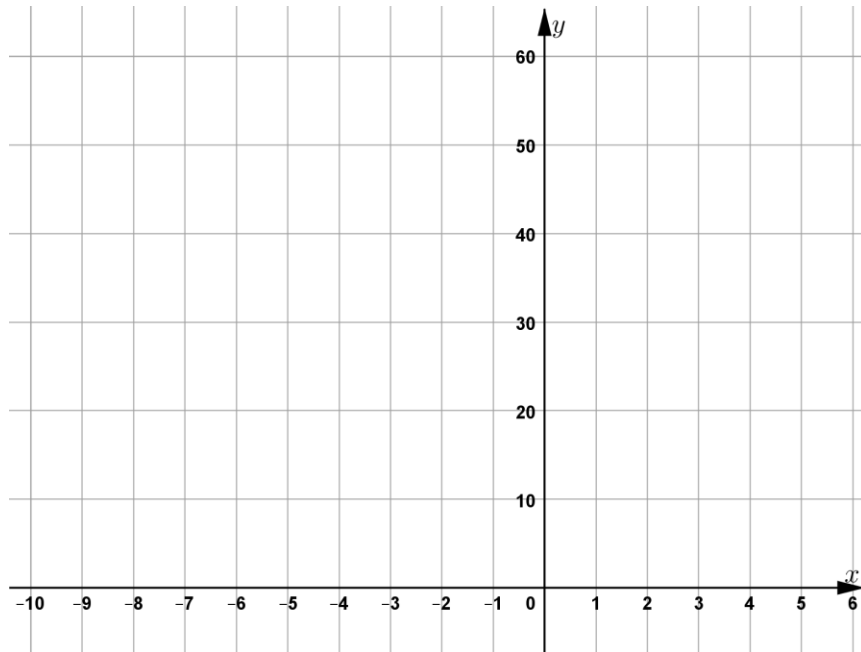
3. Draw the graph $y = f(x)$ where $f(x) = x^2 - 6x - 16$. Calculate, plot and label the y-intercept, the x-intercepts and the vertex.

Show working below the axes.



4. Draw the graph $y = f(x)$ where $f(x) = x^2 + 8x + 20$. Calculate, plot and label the y-intercept, the vertex, and the point which is the reflection of the y-intercept over the line of symmetry of the parabola.

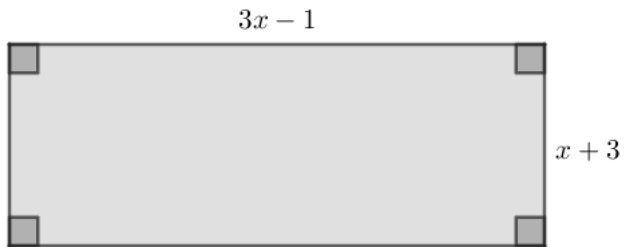
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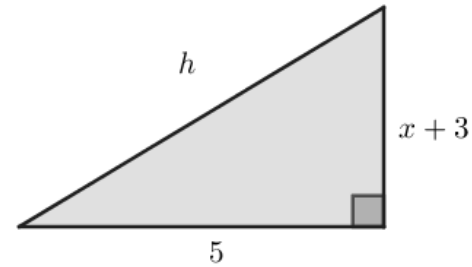
5. Solve the following equations for x . If solutions are irrational, give them both in exact form and correct to 2 decimal places.

(a) $x^2 = 36$	(b) $(x - 5)(2x + 3) = 0$
(c) $(x + 6)^2 - 3 = 0$	(d) $x^2 + 7x - 8 = 0$
(e) $3x^2 - 16 = 0$	(f) $2x^2 + 7x + 3 = 2x + 4$
(g) $\frac{2x}{x-9} = \frac{x+4}{2}$	

6. The area of the rectangle below is 312 cm^2 . Calculate the lengths of each side.



7. A right angled triangle has shorter sides with lengths 5 and $(x + 3)$ as shown in the figure.



(a) Write the length of the hypotenuse h as a function of x .

(b) Find the value of x for which the hypotenuse $h = 10$. Write your answer in simplified, exact form and as a decimal correct to 2 decimal places.