PELMATHISM DERIVATIVES GAME

2, 3 or 4 players

RULES

For all the games large cards can be downloaded from the Let's Play link and cut out.

Sort the cards into 5 sets of 5 cards before you play. Shuffle the cards and place them face down on a table in rows and columns or just spread out. Players take turns to turn over 2 cards. When the cards are from the same set players keep the pair and have another turn. If the cards don't match the two cards are turned face down in the same positions and the next player has a turn. Because there are 5 cards in each set, if a player has 2 cards of a set, and later turns over one more card of that set, the player gets to keep the matching card.

HOW TO WIN

The player with most cards at the end wins the game. If you want to play with a points system, award 1 point for each card won and a bonus of 5 points if a player collects all 5 cards of a set.

MATCHING THE CARDS

Sort these cards into 5 sets of 4 cards matching the functions with their derivatives and with the values of the functions and the values of the derivatives at the given points.

What does this information tell you about the graphs of the functions? Sketch the graphs.

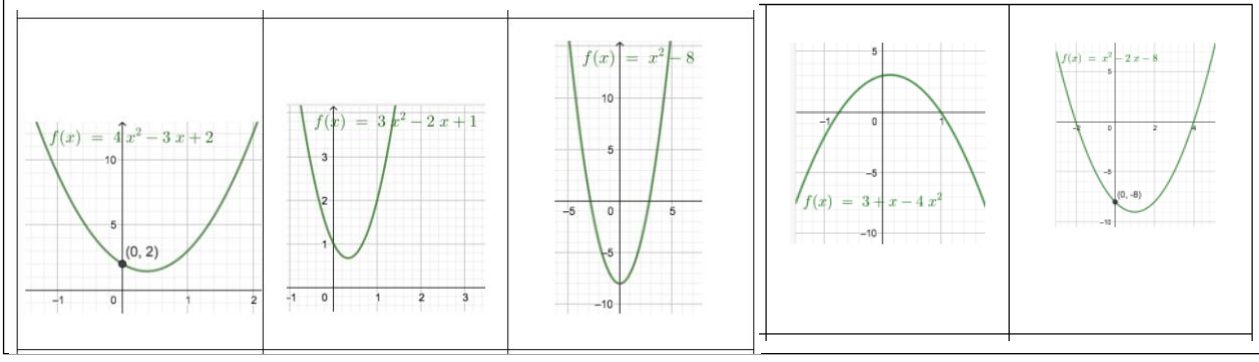
$f(x) = 3x^2 - 2x + 1$	$f'(x) = 8x - 3$	$f'(-1) = 9$	$f(-1) = -5$
$f(x) = x^2 - 8$	$f'(x) = 2x - 2$	$f'(2) = 10$	$f(2) = 12$
$f(x) = 3 + x - 4x^2$	$f'(x) = 2x$	$f'(-1) = -4$	$f(0) = 1$
$f(x) = x^2 - 2x - 8$	$f'(x) = 6x - 2$	$f'(1) = 5$	$f(1) = 0$
$f(x) = 4x^2 - 3x + 2$	$f'(x) = 1 - 8x$	$f'(4) = 8$	$f(3) = 1$

25 large cards down-loaded from the Let's Play link.

WHY DO THIS ACTIVITY?

This activity builds on and extends learners' understanding of graphs of quadratic functions. It is useful, soon after they have learned to differentiate powers of x, to provide practice in finding derivatives, substituting values of x into formulas and visualising graphs when they know some of the properties.

Download the 25 large cards which are all the same shape and size, then print and cut them out and you are ready to play. You can play the game with a reduced set of cards at first.



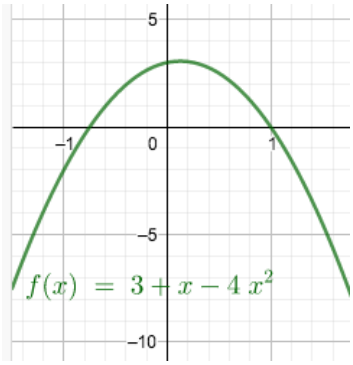
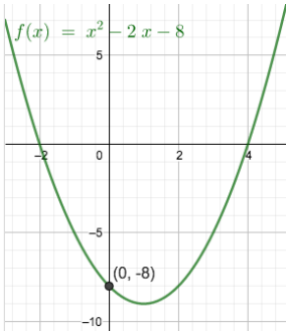
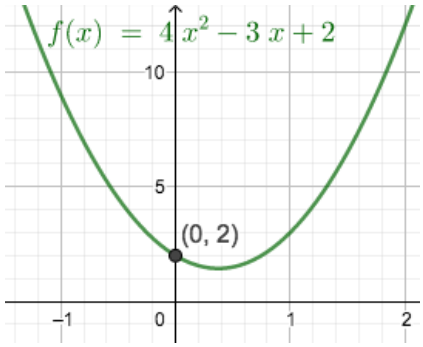
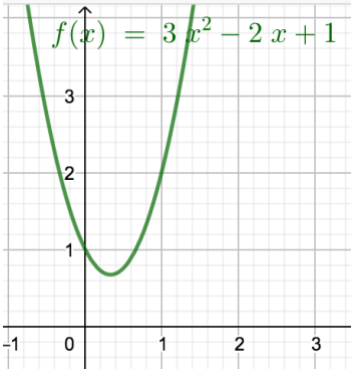
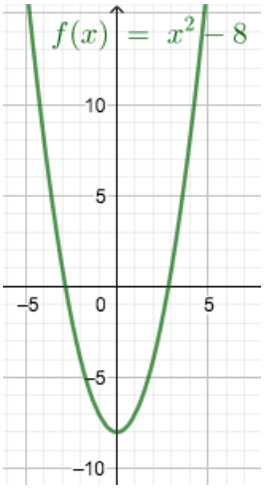
HELP

It may help to work in pairs when you sort the cards. You have 5 functions so start by matching them with the values of the functions for the given values of x (cards in the last column). Having done that you will have 5 pairs of cards and 10 other cards. Next find the derivatives of the functions and take it from there.

NEXT

Work in groups of 4 and make up your own sets of 25 cards for cubic functions.

Exchange your cards with another group. First check the cards then play the game with them.

$f(x)= 3x^2 - 2x + 1$		
		
$f(x)= x^2 - 8$	$f(x)= 3 + x - 4x^2$	$f(x)= x^2 - 2x - 8$

$f(x) = 4x^2 - 3x + 2$	$f'(x) = 8x - 3$	$f'(x) = 2x - 2$
$f'(x) = 2x$	$f'(x) = 6x - 2$	$f'(x) = 1 - 8x$
$f'(-1) = 9$	$f'(4) = 8$	$f'(2) = 10$

$f'(-1) = -4$	$f'(1) = 5$	$f(-1) = -5$
$f(2) = 12$	$f(0) = 1$	$f(1) = 0$
$f(3) = 1$		