

1. State whether the following functions are EVEN, ODD, or NEITHER. Show all working.

(a) $y = 2x^2$	(b) $y = 2x^3$	(c) $y = x^4 - x^2 + 1$	(d) $y = x - x^3 + 1$
(e) $y =  x $	(f) $y = \frac{x}{x^2 - 1}$	(g) $y = (x + 1)^2$	

2. (a) Sketch the graph of  $y = x^3$ ,  $0 \leq x \leq 2$ . Show the coordinates of the endpoints.

(b) The above function is part of an even function  $f(x)$ , defined in the domain  $-2 \leq x \leq 2$ . Draw a sketch of  $y = f(x)$ .

(c) Write a piecemeal description of the function  $f(x)$ .

3. (a) Sketch the graphs of  $y = \sin x$  and  $y = \cos x$  on separate number planes, each in the domain  $-180^\circ \leq x \leq 180^\circ$ .

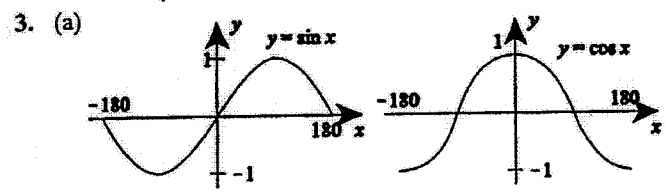
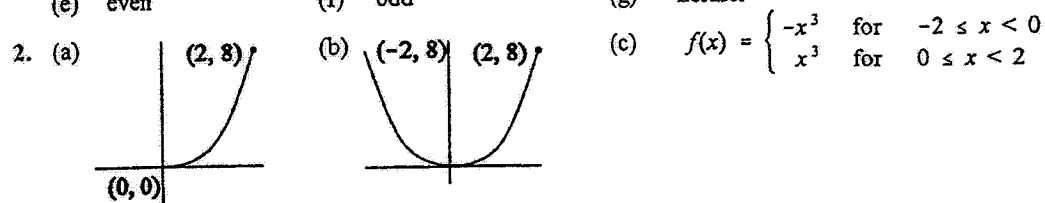
(b) Hence decide if the sine and cosine functions are odd, even or neither.

- (c) Remembering that  $\sin 45^\circ = \cos 45^\circ = \frac{1}{\sqrt{2}}$ , write down the values of  $\sin(-45^\circ)$  and  $\cos(-45^\circ)$ .

4. Show that if an odd function is defined for  $x = 0$ , then its graph must pass through the origin.

**ANSWERS:**

1. (a) even (b) odd (c) even (d) neither  
 (e) even (f) odd (g) neither



- (b) sine is odd; cosine is even (c)  $\sin(-45^\circ) = -\frac{1}{\sqrt{2}}$ ;  $\cos(-45^\circ) = \frac{1}{\sqrt{2}}$