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1 Evaluate each of the following limits.

a) $\lim_{x\to 2}(x^2-4)=$

b) $\lim_{x\to 2}\dfrac{x^2-4}{x+2}=$

c) $\lim_{x\to 2}(x^3-8)=$

d) $\lim_{x\to 2}\dfrac{x^3-8}{x-2}=$

e) $\lim_{x\to 2}\dfrac{x^3-8}{x^2-x-2}=$

f) $\lim_{x\to 1}\dfrac{x^2+4x-5}{x^2+x-2}=$

g) $\lim_{x\to -1}\dfrac{x+1}{x^3+1}=$

h) $\lim_{h\to 0}\dfrac{(a+h)^2-a^2}{h}=$

i) $\lim_{h\to 0}\dfrac{(2+h)^3-8}{h}=$

j) $\lim_{h\to 0}\dfrac{(a+h)^3-a^3}{h}=$

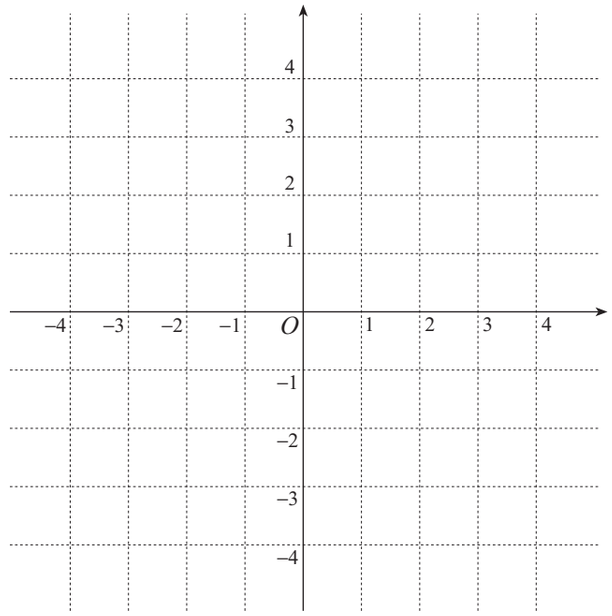
k) $\lim_{h\to 0}\dfrac{\dfrac{1}{a+h}-\dfrac{1}{a}}{h}=$

2 Let $f(x)=\dfrac{x^3}{|x|}$.

a) What is the domain of $f(x)$?

b) By dividing into cases, express $f(x)$ in a form that does not use an absolute value symbol.

c) Draw the graph of $y=f(x)$. (Indicate the point where $f(x)$ is not defined by using the symbol ∘.)



d) Find $\lim_{x\to 0}\dfrac{x^3}{|x|}$ using the graph.

(continues on the reverse side)

3 Find the average rate of change of each of the following functions from $x = 1$ to $x = 2$.

a) $f(x) = 4x - 3$

b) $f(x) = 10x^2 + x$

c) $f(x) = x^3 - 1$

d) $f(x) = -\frac{2}{x}$

4 Find the average rate of change of the function $f(x) = 3 - 2x^2 + x$ by finding $\frac{f(b) - f(a)}{b - a}$.

5 The position function $s(t) = -16t^2 + 144t$ gives the position of a projectile as a function of time. Find the average velocity (average rate of change) from $t = 1$ second to $t = 2$ seconds

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