

Practice RE-Test **NO CALCULATOR SECTION**

[1] Evaluate each expression.

[a]  $1000^{\frac{2}{3}}$

[b]  $\left(\frac{36}{81}\right)^{-\frac{1}{2}}$

[c]  $\left(\frac{8a^9}{27b^{15}}\right)^{-\frac{1}{3}}$

[d]  $\left(\frac{16c^{24}}{d^{16}}\right)^{\frac{3}{4}}$

[2] Simplify each expression. Do not leave any negative exponents in your final answer.

[a]  $(a^4b^{-3})^4(a^{-1}b)^{-3}$

[b]  $\frac{9x^2y^{-3}}{(3xy^{-4})^3} \cdot \frac{25x^{-5}}{(5y^{-2})^3}$

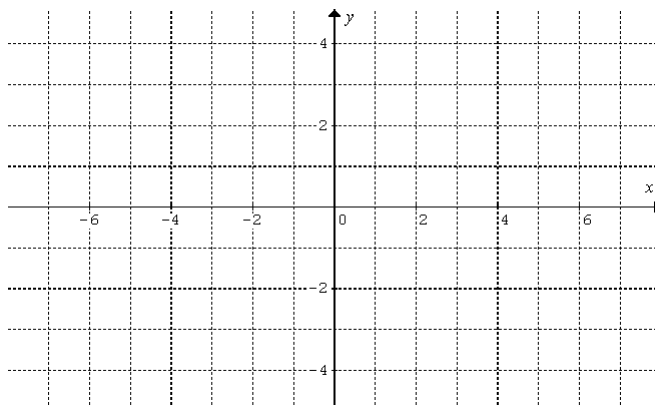
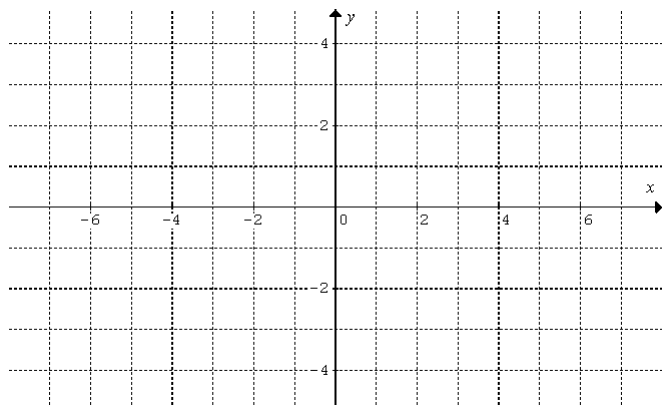
[c]  $\frac{(3x^4y^{-1})^3 \cdot (x^{-4}y^2)^{-2}}{(x^3)^4 \cdot (9y^{-3})^2}$

[4] Perform the operation and simplify your answer.  $\frac{x^2 + x - 12}{x^2 - x - 20} \cdot \frac{x^2 - 3x - 10}{x^2 - 9}$

[5] Sketch each of the following.

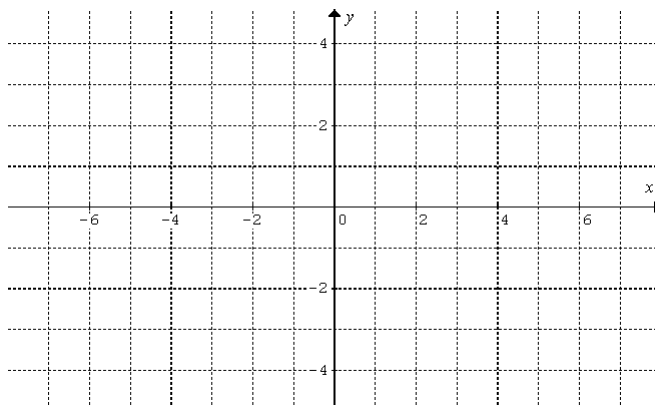
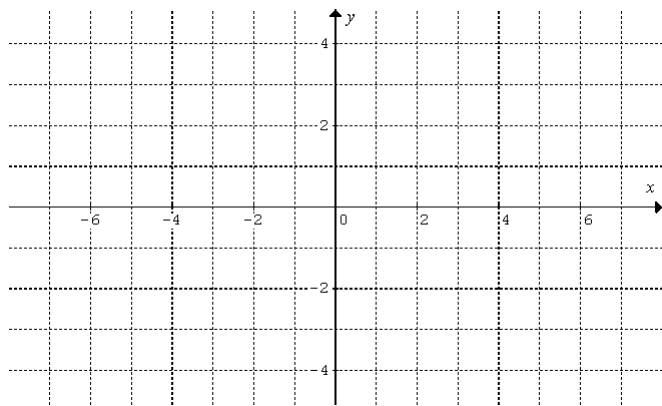
[a]  $y = 3 - |x + 2|$

[b]  $y = 1 + (x - 1)^2$



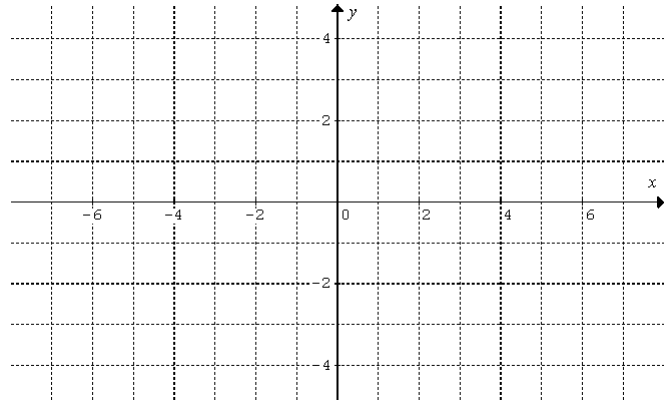
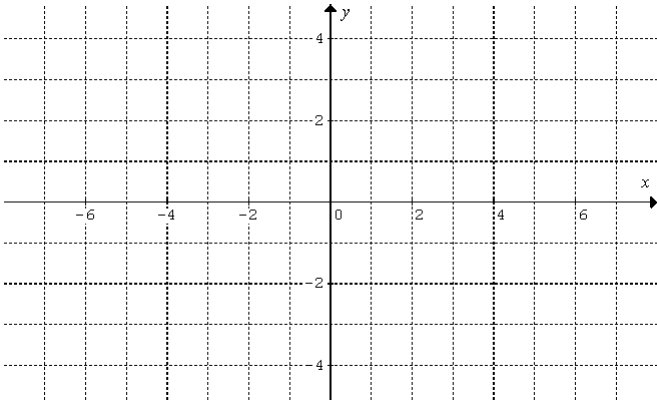
[c]  $y = 1 + \sqrt{x - 1}$

[d]  $y = (x - 2)^3 - 1$



$$[e] y = \begin{cases} 1-x, & x < 1 \\ 1, & x \geq 1 \end{cases}$$

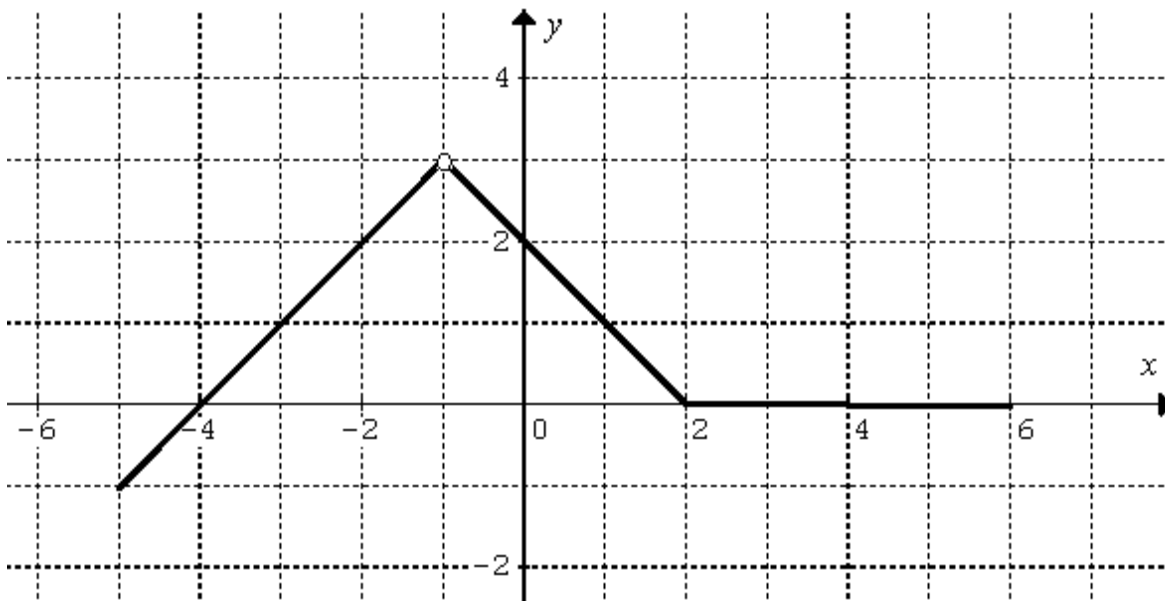
$$[f] y = \begin{cases} -x, & x \leq -1 \\ 2, & -1 < x < 1 \\ x+1, & x \geq 1 \end{cases}$$



[6] State the domain of each function.

$$[a] f(x) = \frac{1}{\sqrt{x+2}} \quad [b] f(x) = \frac{x-2}{x^2-1} \quad [c] f(x) = \sqrt{x^2-x-2}$$

[7] State the domain and range of the function represented by the graph.



[8] Given:  $f(x) = 3x^2 - 4x$  and  $g(x) = 2x - 1$ , evaluate the following.

$$[a] f(g(x)) \quad [b] g(f(x)) \quad [c] g(g(x)) \quad [d] f(f(2))$$

[9] For each of the following functions, find  $f^{-1}(x)$ , the inverse function.

$$[a] f(x) = 3x - 2 \quad [b] f(x) = \frac{3x-1}{x+1} \quad [c] f(x) = x^5 + 3$$

CALCULATOR SECTION

[10] Compute the average rate of change in each function over the given interval.

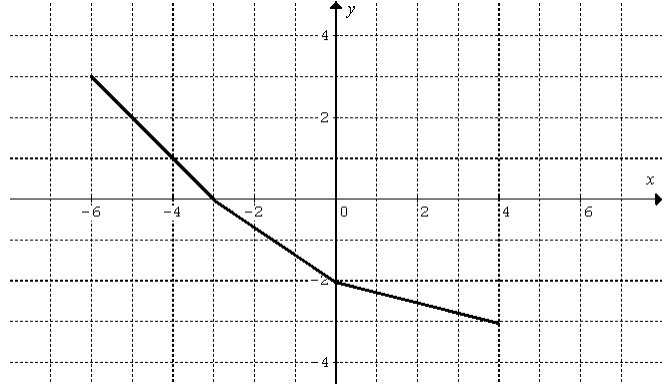
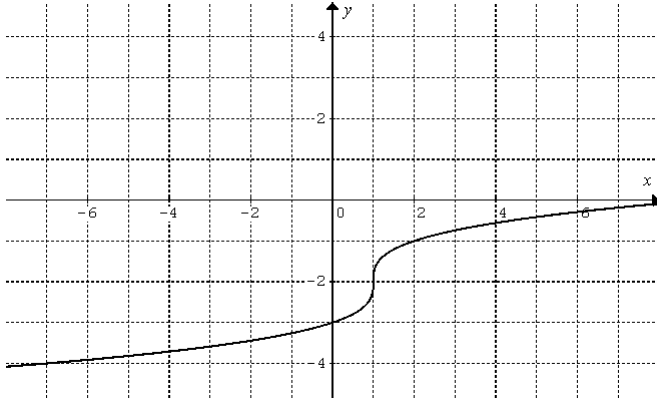
[a]  $f(x) = x^2$  on  $[-3, 2]$

[b]  $f(x) = x^2 + x + 1$  on  $[1, 3]$

[c]  $f(x) = x^2 + x$  on  $[a, a+h]$

[d]  $f(x) = x^2 + x + 1$  on  $[a, a+h]$

[11] On each graph of  $y = f(x)$ , sketch the graph of  $y = f^{-1}(x)$ .



[12] Determine which functions are one-to-one.

[a]  $y = x^5 + x + 1$

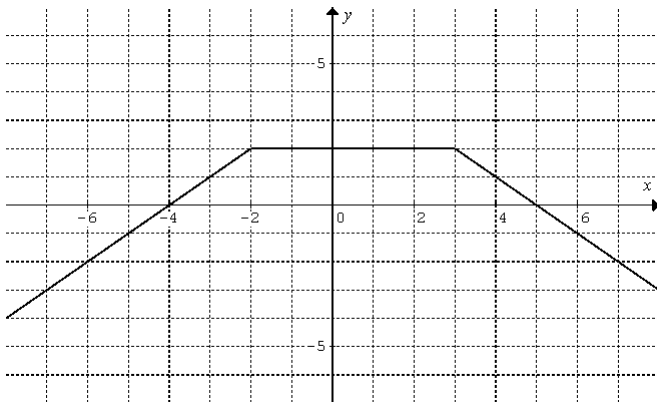
[b]  $y = \frac{2x-4}{x+2}$

[c]  $y = x^3 - x - 1$

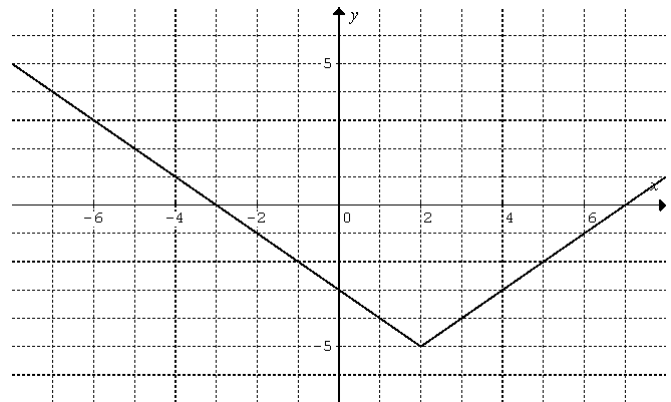
[d]  $y = x^5$

[13] Consider the functions represented by these graphs.

$y = f(x)$



$y = g(x)$



[a]  $f(g(6))$

[b]  $f(f(f(1)))$