

## MATHEMATICS 201-009-50

Precalculus  
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# Maple Introduction Exercises

Try the following problems with Maple

1. Perform the following operations.

a)  $3^4 - 2\sqrt{25}$

b)  $\sqrt[3]{125}$

2. Evaluate  $\frac{\sqrt{2}}{2}$  to 15 decimal places.

3. Simplify the following expressions.

a)  $\frac{x^2 + 7x + 10}{x^2 - 25}$

b)  $x + \frac{1}{x+3}$

4. Factor the following.

a)  $x^3 - 3x^2 + 3x - 1$

b)  $x^{\frac{1}{4}} - 4x^{\frac{-7}{4}}$

5. Expand and simplify.

a)  $(x+2)^4$

b)  $(x+1)^2(x+2) - (x+3)^2$

6. Solve the following equations.

a)  $x^2 - 3x + 1 = 0$

b)  $\sqrt{2x+1} = 5$

7. Define the function  $f(x) = 2x^3 - 3x + 1$ .

a) Find  $f(-2)$

b) Find  $f(t+2)$

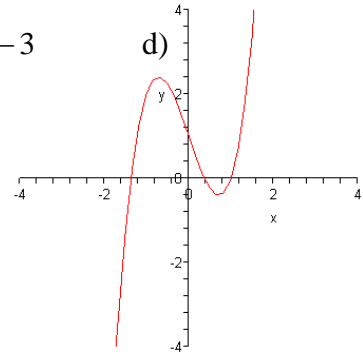
b) Find  $\frac{f(x+h) - f(x)}{h}$

c) Sketch the graph of  $f(x)$ .

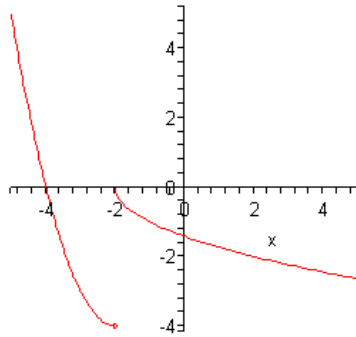
8. Define the function  $f(x) = \begin{cases} 4x + x^2 & x \leq -2 \\ -\sqrt{x+2} & x > -2 \end{cases}$ .
- Find  $f(5)$ .
  - Sketch the graph of  $f(x)$ .
9. Define the function  $f(x) = \frac{1}{x+2}$  and  $g(x) = \frac{x}{2x-1}$ .
- Find  $(f+g)(x)$ .
  - Find  $(f \circ g)(x)$ .
  - Find  $(g \circ f)(x)$ .
  - Plot, on the same graph, the function  $f$  and  $g$ .
10. Sketch the graph of the curve  $y^2(y^2 - 4) = x^2(x^2 - 5)$ .

**ANSWERS**

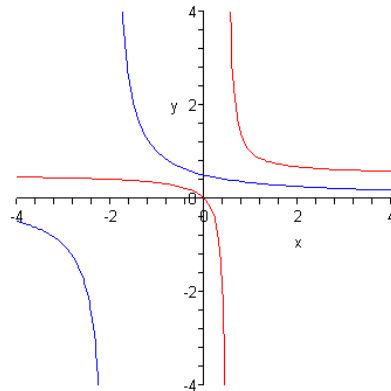
1. a) 71                      b) 5  
 2. 0.707106781186550  
 3. a)  $\frac{x+2}{x-5}$                       b)  $\frac{x^2+3x+1}{x+3}$   
 4. a)  $(x-1)^3$                       b)  $\frac{(x-2)(x+2)}{x^4}$   
 5. a)  $x^4 + 8x^3 + 24x^2 + 32x + 16$                       b)  $x^3 + 3x^2 - x - 7$   
 6. a)  $\frac{3}{2} \pm \frac{1}{2}\sqrt{5}$                       b) 12  
 7. a) -9                      b)  $2t^3 - 12t^2 + 21t + 11$                       c)  $6x^2 + 6xh + 2h^2 - 3$



8. a)  $-\sqrt{7}$                       b)



9. a)  $\frac{x^2+4x-1}{(2x-1)(x+2)}$                       b)  $\frac{2x-1}{5x-2}$                       c)  $\frac{-1}{x}$                       d)



- 10.

