Mathé 42S – Exercice 7

A.

Trouve la dérivée des fonctions suivantes.
Find the derivative of the following functions.

1) $y = \sqrt{x} + \dfrac{1}{\sqrt{x}}$

2) $y = x^{5/2} - \dfrac{2}{3}x^{3/4}$

3) $y = 8x^4 - 2x^3 - x^{-2}$

4) $y = -3x^3 - \sqrt[6]{x}$

5) $y = \sqrt[3]{x} \cdot \sqrt[4]{x} \cdot \sqrt[5]{x}$

6) $y = \dfrac{8x}{\sqrt{x}}$

7) $y = \sqrt{3x}$

8) $y = \sqrt{5x-4}$

9) $y = \sqrt[3]{3x^2 - 4}$

10) $y = \dfrac{1}{\sqrt{1-x}}$

11) $y = (x^3 - 2)^2\sqrt{x}$

12) $y = (2x+1)^{-3}(3x-7)^6$

13) $y = \dfrac{(3x-5)^{3/2}}{(5-9x)^{1/3}}$

14) $y = \dfrac{7x}{\sqrt{5-2x}}$

15) $y = \sqrt{5+\sqrt{x}}$

16) $(x+1)\sqrt{x^2+2x+2}$

17) $y = \sqrt{x+3} \cdot \sqrt[3]{5x-1}$

B. Pour les fonctions suivantes trouvez la valeur de a) $f(3)$ b) $f'(3)$ et faites le graphique de la fonction. Essayez de prédire si les valeurs de f(3) et f'(3) vont être positives ou négatives avant de les calculer

1) $f(x) = \sqrt{x-1}$

2) $f(x) = -2x^3$

3) $f(x) = \dfrac{x-4}{x-3}$

4) $f(x) = \dfrac{1}{x^2-4}$

5) $f(x) = \dfrac{4}{x^2+25}$

6) $f(x) = x^2 - 7$

7) $f(x) = (x-5)^2 + 1$

8) $f(x) = -\sqrt{2x-14}$

9) $f(x) = x(x+2)(x-5)$

Réponses 425 - #7

1) $y' = \frac{1}{2}x^{-1/2} - \frac{1}{2}x^{-3/2}$

2) $y' = \frac{5}{2}x^{3/2} - \frac{1}{2}x^{-1/4}$

3) $y' = 32x^3 - 6x^2 + 2x^{-3}$

4) $y' = -9x^2 - \frac{1}{6}x^{-5/6}$

5) $y' = 47/60\, x^{-13/60}$

6) $y' = 4x^{-1/2}$

7) $y' = 3/2(3x)^{-1/2}$

8) $y' = 5/2(5x-4)^{-1/2}$

9) $y' = 2x(3x^2-4)^{-2/3}$

10) $y' = \frac{1}{2}(1-x)^{-3/2}$

11) $y' = 6x^2(x^3-2)x^{1/2} + \frac{1}{2}x^{-1/2}(x^3-2)^2$

12) $y' = -6(2x+1)^{-4}(3x-7)^6 + 18(3x-7)^5(2x+1)^{-3}$

13) $y' = \dfrac{9/2(3x-5)^{1/2}(5-9x)^{1/3} + 3(5-9x)^{-2/3}(3x-5)^{3/2}}{(5-9x)^{2/3}}$

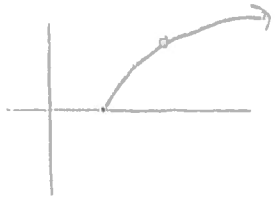
14) $y' = \dfrac{7(5-2x)^{1/2} + (5-2x)^{-1/2}\cdot(7x)}{5-2x}$

15) $y' = \frac{1}{2}(5+x^{1/2})^{-1/2}(\frac{1}{2}x^{-1/2})$

16) $y' = (x^2+2x+2)^{1/2} + (x+1)\frac{1}{2}(x^2+2x+2)^{-1/2}(2x+2)$

17) $y' = \frac{1}{2}(x+3)^{-1/2}(5x-1)^{1/3} + 5/3(5x-1)^{-2/3}(x+3)^{1/2}$

B 1)



$f(3) = \sqrt{2}$

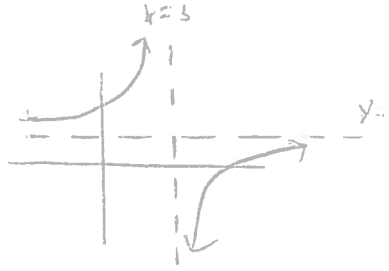
$f'(3) = \frac{1}{2\sqrt{2}}$

2)

$f(3) = -54$

$f'(3) = -54$

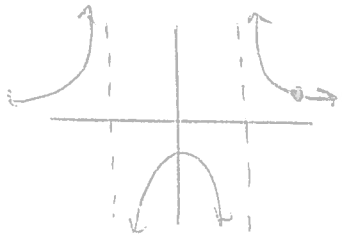
3)



$f(3) = \nexists$

$f'(3) = \nexists$

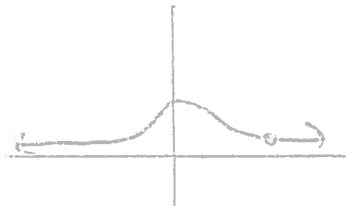
4)



$f(3) = 1/5$

$f'(3) = -6/25$

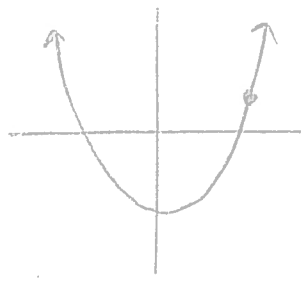
5)



$f(3) = 4/34 = 2/17$

$f'(3) = -5/289$

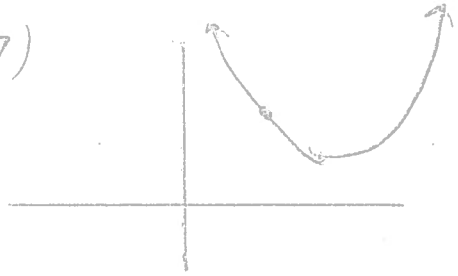
6)



$f(3) = 2$

$f'(3) = 6$

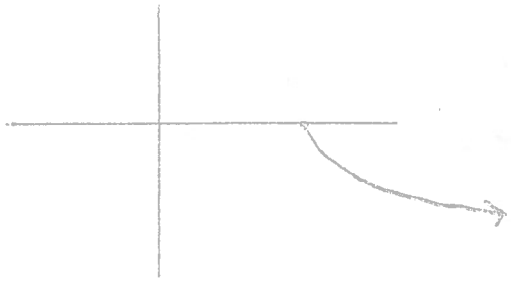
7)



$f(3) = 5$

$f'(3) = -4$

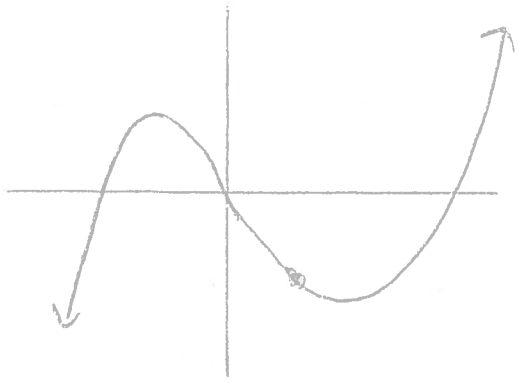
8)



$f(3) = \nexists$

$f'(3) = \nexists$

9)



$f(3) = -30$

$f'(3) = -1$