TEMA 1 : Aplicacions de les derivades

Solucions

Problemes de funcions

1. $a = \frac{8}{3} \quad b = \frac{4}{3} \quad c = 0 \quad d = -3$

2. $3a + c = 0$, $b = 0$, $d = 2$

3. $a = \frac{-3}{2} \qquad b = -6 \quad c = \frac{-13}{2}$

4. r_{tng}: $y - 7 = 5(x - 3)$

5. $a = \frac{1}{3} \qquad b = -3 \quad c = 5$

6. $a = 1, b = 3, c = 0, d = 4$

7. $a = 2, b = -18, c = 16$

8. $P(\frac{-1}{2}, \frac{1}{4}); \quad r\tan : y - \frac{1}{4} = 2(x + \frac{1}{2})$; $rnor : y - \frac{1}{4} = \frac{-1}{2}(x + \frac{1}{2})$

9. P(2,1)

10. $a = 3; b = \frac{-7}{5}$

11. $a = 1, b = -3 ; c = 3$

12. a) $x = \frac{3}{2}$ b) $b = \frac{-9}{4}$

13. a) $a = 3$; b) $P(0,0)$

14. $P(-1, \frac{-1}{e}); \quad r\tan : y = \frac{1}{e}$

15. $p(1, \ln 2); \quad r\tan : y - \ln 2 = (x - 1)$

16. $a = \frac{1}{2} \quad b = \frac{3}{2}$

17. $a = 0, b = -2, c = 1$

Problemes d'optimització

1. x = y = $\sqrt[3]{V}$ unitats. És un cub

2. α = 45º

3. $r = \sqrt[3]{2}$ unitats , $h = 2\sqrt[3]{2}$ unitats

4. a) $4\sqrt{3}cm$ b) $d(p,A) = d(p,B) = \sqrt{x^2+16}$; $d(P,C) = 4\sqrt{3} - x$ c) $\frac{4\sqrt{3}}{3}$ cm

5. A(6,0); B(2,0); C(2,6); D(6,6)

6. a) $B(x) = 100x + \dfrac{250(40-5x)}{10-x}$ b) x = 5 tones

7. $x = \frac{\sqrt{30}}{3}$ m, $y = \frac{\sqrt{30}}{5}$ m

8. x = 1

9. Triangle isòsceles $x = y = 15\sqrt{2}cm$

10. x = 600 m ; y = 300m

11. El punt C es trobarà a $\dfrac{\sqrt{3}}{10}km$ del punt A'

12. A 2 km de A i 3km de B

13. $b) x = y = \dfrac{3}{2}m \quad c) A = \dfrac{27}{4}m^2$

14. $r = \dfrac{10}{\sqrt{4+\pi}}m \quad , h = \dfrac{10}{(4+\pi)\sqrt{4+\pi}}m$

15. $P\left(2,2\sqrt{2}\right)$

16. $P_1(1,1)$; $P_2(-1,-1)$

17. x = 8m; h = 12m

18. $x = y = 5\sqrt{2}cm$. Triangle isòsceles

19. $a)\ l = \dfrac{x}{2} \quad c) x = 8\sqrt{2}$ unitats

20. $c)\ h = \frac{R\sqrt{3}}{3} \quad r = \frac{R\sqrt{6}}{3}$

21. b) B(4,0); C(4,2)

22. $b)\ x = 10\sqrt[4]{3}m$