Watch. Practice. Understand. | Lesson 088

The Secret of Finding Local Maximum and Minimum on TI 84 Graphing Calculator

Watch the matching video: https://www.youtube.com/watch?v=HsESy9Q9Nfl

Practice focus: Quadratic equations and graphs

Original extra practice matched to the listed lesson topic.

Name: _____ Date: _____ Show your reasoning and check units.

01 Solve $x^2 - 7x + 12 = 0$.

02 Solve $x^2 + 4x - 1 = 0$ exactly.

03 Find the vertex, axis and minimum of $y = 2(x - 3)^2 - 8$.

04 A rectangle has area 60 m^2 and length 4 m more than width. Find its dimensions.

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Practice focus: Graphing and fitting models

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Name: _____ Date: _____ Show your reasoning and check units.

05 The data are (0,2), (1,5), (2,8). Find an exact linear model and predict y at x = 5.

06 The data are (0,3), (1,6), (2,12). Find an exact exponential model.

07 A fitted model predicts 12.5 when the observed value is 14. Find the residual.

08 Use a graphing tool to find the intersections of $y = x^2$ and $y = x + 2$; then verify algebraically.

Worked answers | Lesson 088

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01 Solve $x^2 - 7x + 12 = 0$.

Factor: $(x - 3)(x - 4) = 0$. Roots: 3 and 4.

02 Solve $x^2 + 4x - 1 = 0$ exactly.

Complete the square: $(x + 2)^2 = 5$. Thus $x = -2 \pm \sqrt{5}$.

03 Find the vertex, axis and minimum of $y = 2(x - 3)^2 - 8$.

Vertex (3, -8); axis $x = 3$. Since $2 > 0$, minimum is -8.

04 A rectangle has area 60 m² and length 4 m more than width. Find its dimensions.

$w(w + 4) = 60$, so $(w + 10)(w - 6) = 0$. Reject -10: width 6 m, length 10 m.

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05 The data are (0,2), (1,5), (2,8). Find an exact linear model and predict y at x = 5.

Slope 3 and intercept 2 give y = 3x + 2; y(5) = 17.

06 The data are (0,3), (1,6), (2,12). Find an exact exponential model.

The values double with each unit of x: y = 3(2)^x.

07 A fitted model predicts 12.5 when the observed value is 14. Find the residual.

Residual = observed - predicted = 14 - 12.5 = 1.5.

08 Use a graphing tool to find the intersections of $y = x^2$ and $y = x + 2$; then verify algebraically.

$x^2 - x - 2 = (x - 2)(x + 1) = 0$. Intersections (-1,1), (2,4).