

THUR 4-24-08 P.62

$$\textcircled{1} (-1, -33); (4, -3); (2, -3)$$

GENERAL EQUATIONS OF A PARABOLA:

- * 1) STANDARD FORM: $y = A \cdot x^2 + B \cdot x + C$
2) VERTEX FORM: $y = A \cdot (x - H)^2 + V$ VERTEX: (H, V)
 $\rightarrow y = A \cdot x^2 + B \cdot x + C$; FIND A, B, C .

$$(-1, -33): -33 = A \cdot (-1)^2 + B \cdot (-1) + C$$
$$A - B + C = -33 \quad (1)$$

$$(4, -3): -3 = A(4)^2 + B(4) + C$$
$$16A + 4B + C = -3 \quad (2)$$

$$(2, -3): -3 = A(2)^2 + B(2) + C$$
$$4A + 2B + C = -3 \quad (3)$$

$$A - B + C = -33$$

$$16A + 4B + C = -3$$

$$4A + 2B + C = -3$$

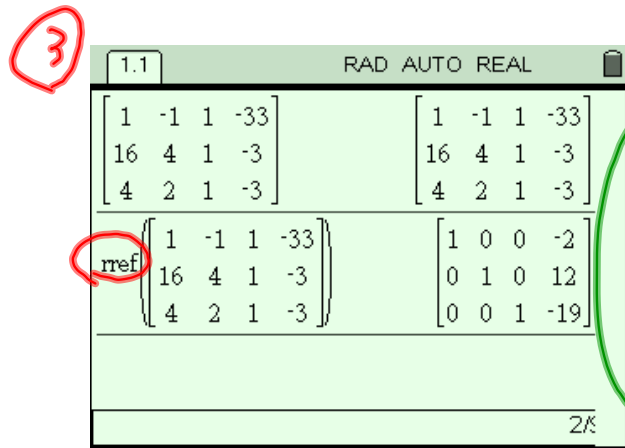
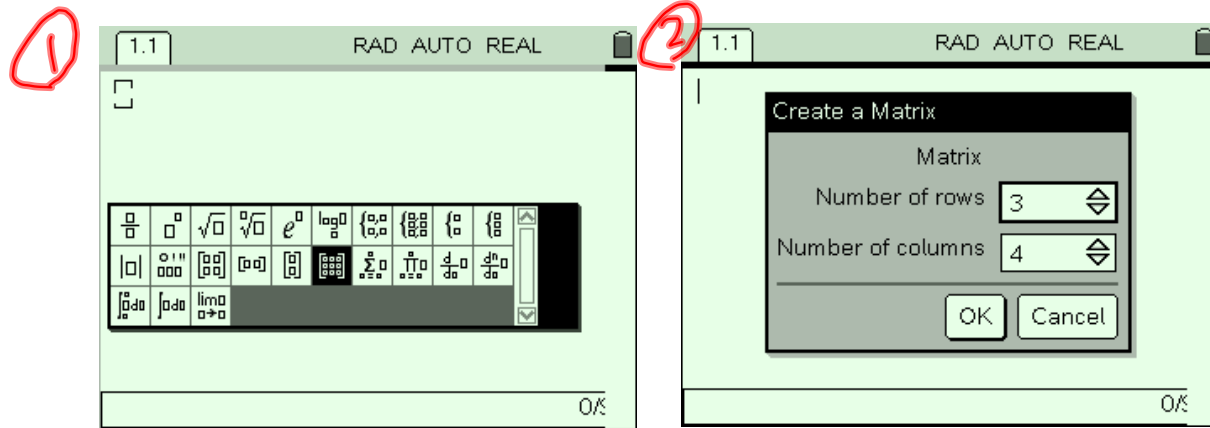
SOLVE THIS 3×3
SYSTEM OF EQS.

USE MATRICES.

AUGMENTED MATRIX

$$\left[\begin{array}{ccc|c} 1 & -1 & 1 & -33 \\ 16 & 4 & 1 & -3 \\ 4 & 2 & 1 & -3 \end{array} \right]$$

rref



$$\begin{bmatrix} 1 & 0 & 0 & : & -2 \\ 0 & 1 & 0 & : & 12 \\ 0 & 0 & 1 & : & -19 \end{bmatrix}$$

$$1A + 0B + 0C = -2$$

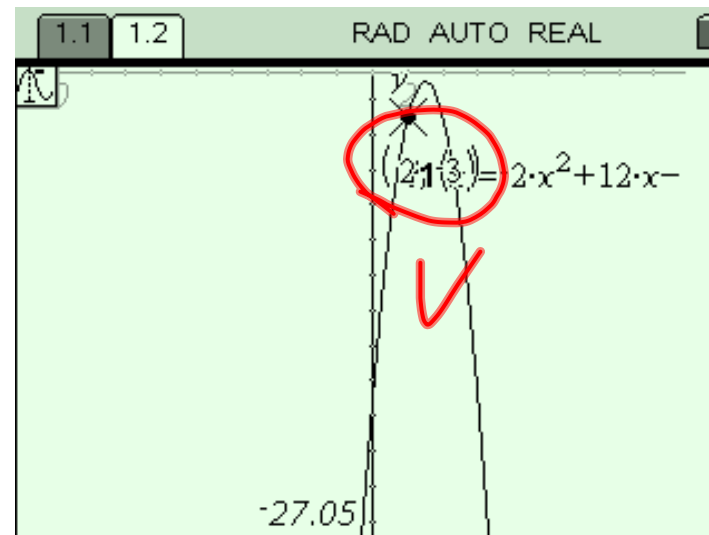
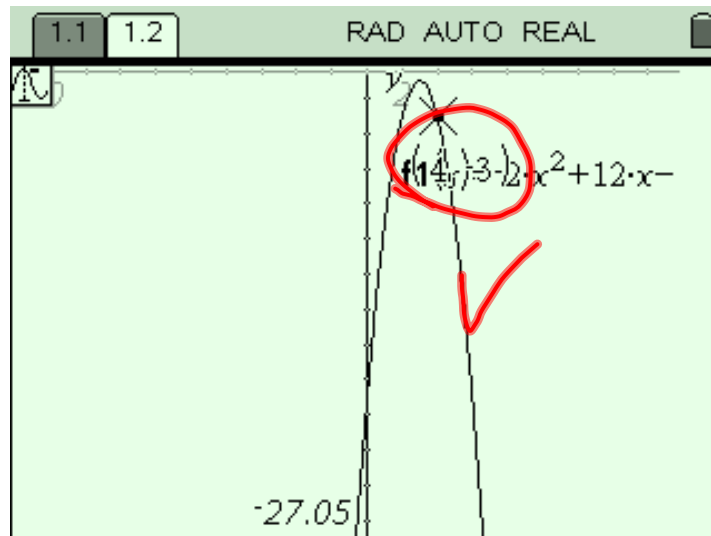
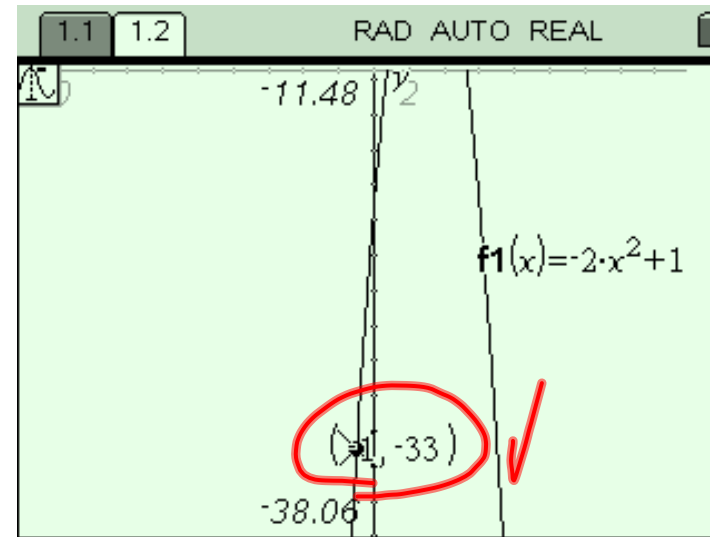
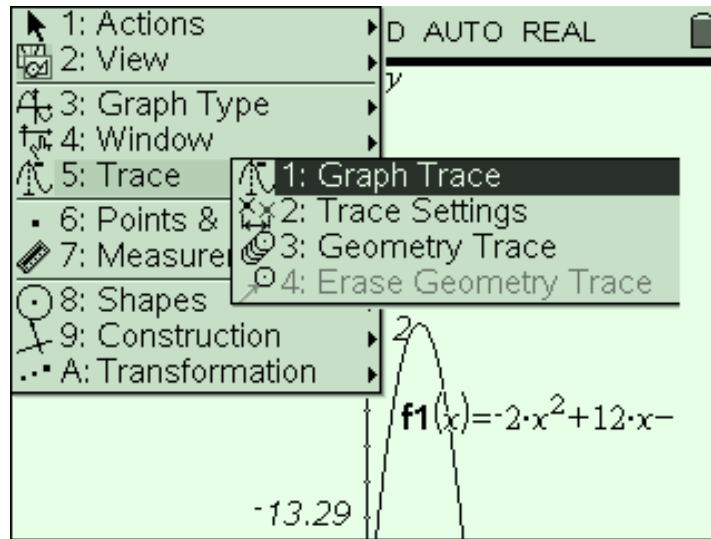
$$A = -2$$

$$B = 12$$

$$C = -19$$

∴ EQ. OF PARABOLA:

$$\underline{\underline{y = -2x^2 + 12x - 19}}$$



● $y = -2x^2 + 12x - 19$ STANDARD FORM

→ VERTEX FORM? C.I.S. COMPLETE THE SQUARE.

$$\frac{y}{-2} = x^2 - 6x + \frac{19}{2}$$

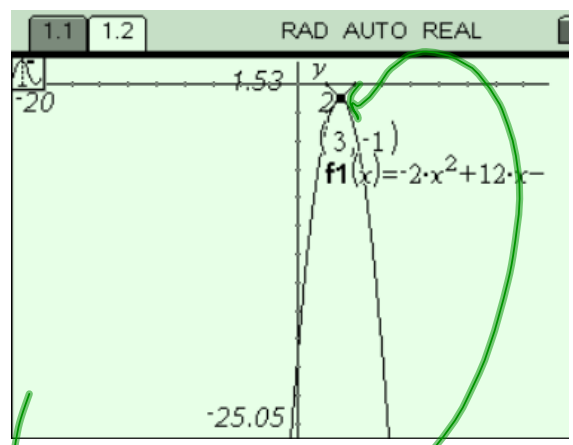
$$\frac{y}{-2} - \frac{19}{2} + \frac{18}{2} = x^2 - 6x + 9 \quad \left(-\frac{6}{2}\right)^2 = (-3)^2 = 9$$

$$\frac{y}{-2} - \frac{1}{2} = (x-3)^2 \quad \text{EQUIVALENT FORMS}$$

$$\left[\frac{y}{-2} = (x-3)^2 + \frac{1}{2} \right] \cdot -2$$

● $y = -2(x-3)^2 - 1$

IN VERTEX FORM: (3, -1)



④ CUBIC EQ. THAT CONTAINS:

$$(-1, 10) \quad (1, 4) \quad (3, -10) \quad (4, -50)$$

GENERAL CUBIC EQUATION:

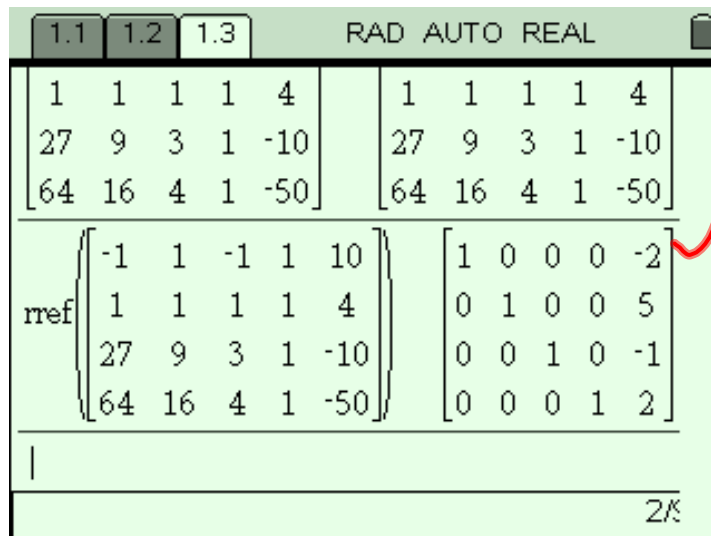
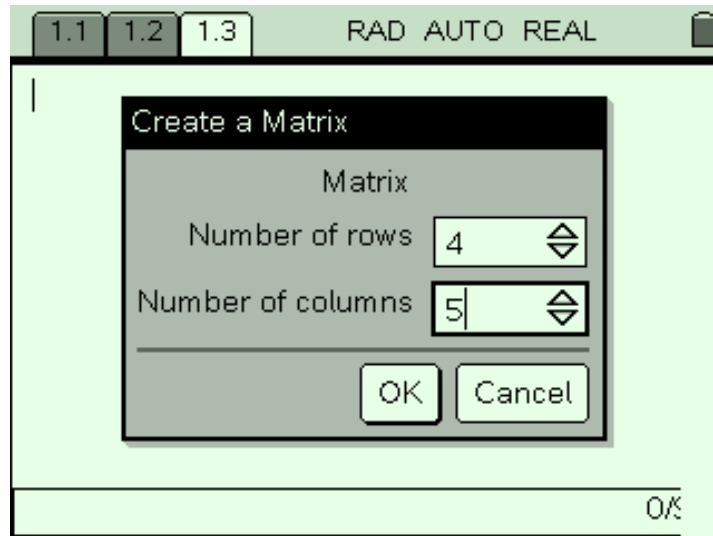
$$y = A \cdot x^3 + Bx^2 + Cx + D$$

$$(-1, 10) \rightarrow 10 = A(-1)^3 + B(-1)^2 + C(-1) + D \rightarrow -A + B - C + D = 10 \quad (1)$$

$$(1, 4) \rightarrow 4 = A(1)^3 + B(1)^2 + C(1) + D \rightarrow A + B + C + D = 4 \quad (2)$$

$$(3, -10) \rightarrow -10 = A(3)^3 + B(3)^2 + C(3) + D \rightarrow 27A + 9B + 3C + D = -10 \quad (3)$$

$$(4, -50) \rightarrow -50 = A(4)^3 + B(4)^2 + C(4) + D \rightarrow 64A + 16B + 4C + D = -50 \quad (4)$$



$A = -2 \quad B = 5 \quad C = -1 \quad D = 2$

EQ:

$y = -2x^3 + 5x^2 - x + 2$

CHECK w/G.C.

OHIO TURNPIKE 2007 (SOME OF THE ANSWERS)

EQUATION: $y = .0428581543x - .0011515034$

OMIT #2, 11

③ *3.30 ④ *5.35 ⑤ *12.85; *14.55

⑥ $y = .0429x - .0012$

- SLOPE = $m = .0429$ IS THE COST PER MILE, 4.29 CENTS
- y -INT = $b = -.0012$ IS THE COST TO GET ON THE TURNPIKE -.12 CENTS (?? SILLY??)

$T(m) = .0429m - .0012$

"TOLLS ARE A FUNCTION OF THE MILES"

⑦ 60.6 miles ⑧ 174.9 miles

• O.T.L. CORRECT/FINISH p.65 1, 3-10

• P.62 2, 5, 7 (LEAVE EQS. IN CALCULATOR)