

5.1 & 5.2

pg. 237 # 3-12 x 3, 20 (matrix) 21, 22

pg. 244 # 3-39 x 3

3. $y = 3x(x-2)$ quadratic after distributing

$$y = 3x^2 - 6x$$

quad term $3x^2$ Linear term $-6x$ constant = 0

12. look at graph. vertex is a min at $(-1, -4)$
axis of symmetry goes through vertex $x = -1$

20. $y = ax^2 + bx + c$
plug in x & y

x	-1	1	2
$f(x)$	17	17	8
	#1	#2	#3

#1 $17 = a(-1)^2 + b(-1) + c$
 $17 = a - b + c$

#2 $17 = a(1)^2 + b(1) + c$
 $17 = a + b + c$

#3 $8 = a(2)^2 + b(2) + c$
 $8 = 4a + 2b + c$

$$\begin{bmatrix} 1 & -1 & 1 \\ 1 & 1 & 1 \\ 4 & 2 & 1 \end{bmatrix} \begin{bmatrix} a \\ b \\ c \end{bmatrix} = \begin{bmatrix} 17 \\ 17 \\ 8 \end{bmatrix}$$

$$A^{-1}B \quad a = -3 \quad b = 0 \quad c = 20$$
$$y = -3x^2 + 20$$

21. use graphing calculator. with QuadReg
equation in Y_1 , look up $x = 2.5$ to find y
in the table for part b.

$$a = -16 \quad b = 33 \quad c = 46 \quad y = -16x^2 + 33x + 46$$

$$f(2.5) = 28.5 \text{ feet}$$

3. $y = 2x^2 + 4$ vertex $(0, 4)$ axis of sym. $x = 0$
 Graph on GP. $2(1)^2 = 2(1) = 2$ over 1, up 2 $2(2)^2 = 2(4) = 8$ over 2 up 8

12. $y = x^2 + 4x + 1$ $x = -\frac{b}{2a} = -\frac{4}{2(1)} = -\frac{4}{2} = -2$

$y = (-2)^2 + 4(-2) + 1$ vertex $(-2, -3)$
 $4 - 8 + 1 = -3$ AOS $x = -2$

$(1)^2 = 1$ over 1 up 1 $2^2 = 4$ over 2 up 4 $3^2 = 9$ over 3 up 9 GP.

the constant is 1, double-check it's the y-intercept on graph.

24. $y = -2x^2 - 3x + 4$ $x = -\frac{b}{2a} = \frac{3}{2(-2)} = \frac{3}{-4} = -\frac{3}{4}$

$y = -2\left(\frac{3}{4}\right)^2 - 3\left(\frac{3}{4}\right) + 4$

$y = -2 \cdot \frac{9}{16} - \frac{9}{4} + 4$

$y = -\frac{9}{8} - \frac{18}{8} + \frac{32}{8} = \frac{5}{8}$

vertex $\left(-\frac{3}{4}, \frac{5}{8}\right)$
 maximum

30. $C = 0.000015x^2 - 0.03x + 35$ parabola opens up, vertex is minimum. x is tires.

$x = -\frac{b}{2a} = \frac{.03}{2(.000015)} = 1000$ tires

$C = 0.000015(1000)^2 - .03(1000) + 35$
 $C = \$20$

33. GP

39. $y = -\frac{1}{2}x^2 - 2x + 1$ should compress & open down.
eliminate B.

$$x = -\frac{b}{2a} = \frac{2}{2(-\frac{1}{2})} = -2$$

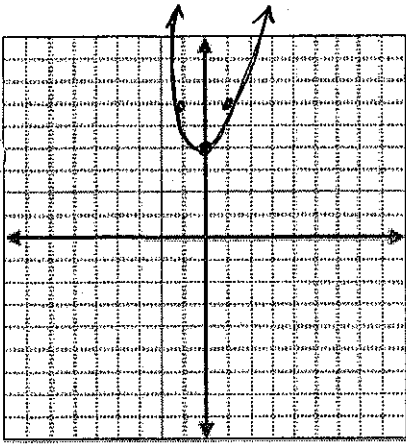
$$y = -\frac{1}{2}(-2)^2 - 2(-2) + 1$$
$$-\frac{1}{2}(4) - 2(-2) + 1$$
$$-2 + 4 + 1 = 3$$

vertex (-2, 3)

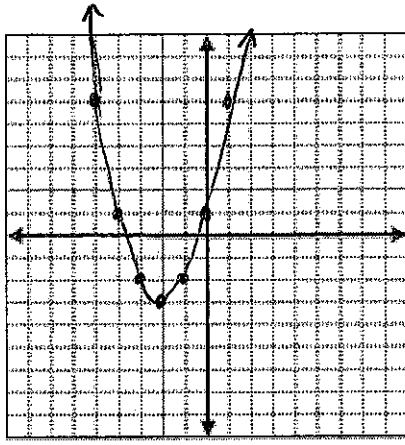
graph A.

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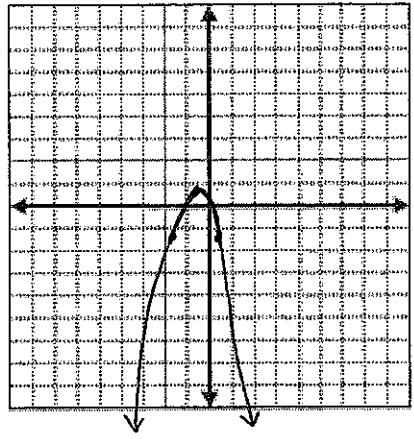
3.



12.



24.



33.

