Name_______________ Class________________________ Date_______________

1 Michael stands at the top of a 768-foot cliff and throws his algebra book directly upward with a velocity of 32 feet per second. The height of his book above the ground *t* seconds later is given by the formula

$$h = -16\,t^2 + 32\,t + 768$$

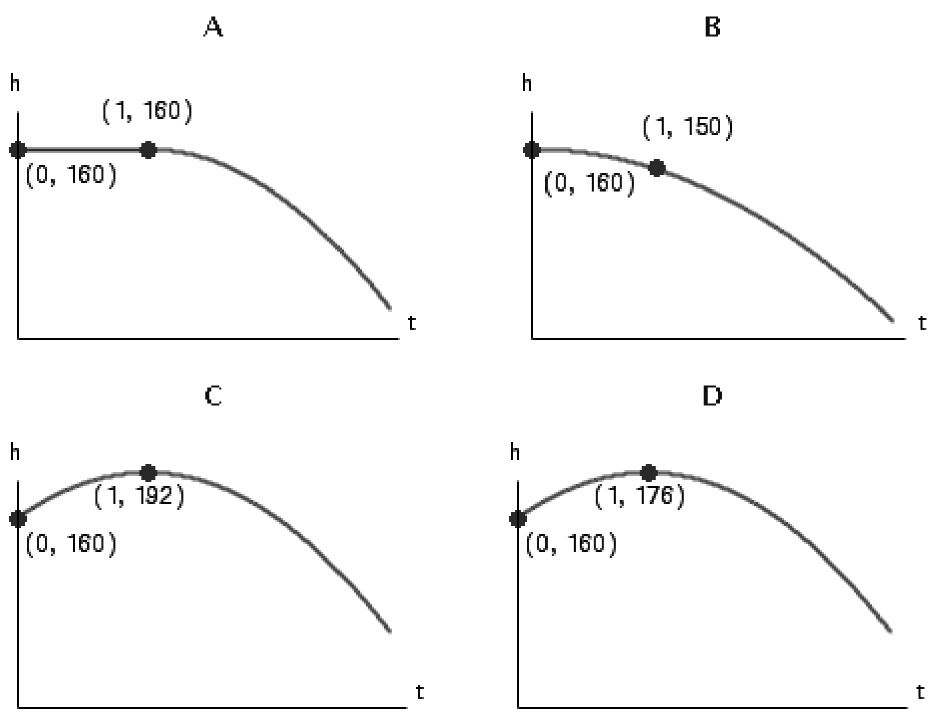
where *h* is in feet. Use your calculator to make a table of values for the height formula.

t (in sec)	*h* (in feet)
0	
0.5	
1	
4.5	
8	

2 James Bond stands on top of a 160-foot building and throws a film canister upward to a fellow agent in a helicopter. The height of the film canister, when it reaches *h* feet above the ground, *t* seconds later, is given by the following formula.

$$h = -16t^2 + 32t + 160$$

Graph the height formula on your calculator by making a table of values with increments of 0.5 seconds. If the agent misses the canister, how long will it take to hit the ground? Select the graph corresponding to the height formula and enter the number of seconds rounded to the nearest tenth.



3 Find a quadratic equation whose solutions are $\frac{7}{2}$ and -7. If there is more than one equation, choose the equation with integer coefficients that do not have a common integer factor. Express the equation in standard form.

4 Solve the equation by factoring.

$a^2 + 4a - 12 = 0$

a. $a_1 = 6,\ a_2 = -6$

b. $a_1 = 2,\ a_2 = -6$

c. $a_1 = 2,\ a_2 = 6$

d. $a_1 = 2$

e. $a_1 = -2,\ a_2 = -6$

5 Write a quadratic equation whose solutions are given. The equation should be in standard form with integer coefficients.

$-\frac{1}{7}$ and $\frac{4}{3}$

6 Solve by completing the square.

$x^2 + 8x + 16 = 0$

7 Solve by completing the square. Your answers will involve *b*.

$x^2 + bx + 5 = 0$

a. $x = -\frac{b}{2} \pm \sqrt{\frac{b^2 - 10}{4}}$

b. $x = -\frac{b}{2} \pm \sqrt{\frac{b^2 - 20}{4}}$

c. $x = -\frac{b}{2} \pm \sqrt{\frac{b^2 + 22}{4}}$

d. $x = \frac{b}{2} \pm \sqrt{\frac{b^2 - 5}{4}}$

e. $x = \frac{b}{2} \pm \sqrt{\frac{b^2 - 20}{4}}$

8 Solve using the quadratic formula. Round your answer to three decimal places.

$5z^2 = 6.3z + 3.6$

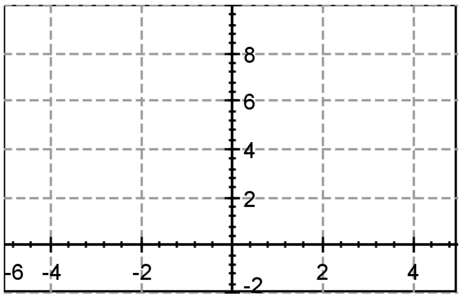
$z =$ _____________

9 Use the quadratic formula to solve the equation for *W*.

$A = 8W^2 + 9LW$

10 Sketch the graph.

$y = x^2 + 3$



11 Find the x-intercepts of the graph.

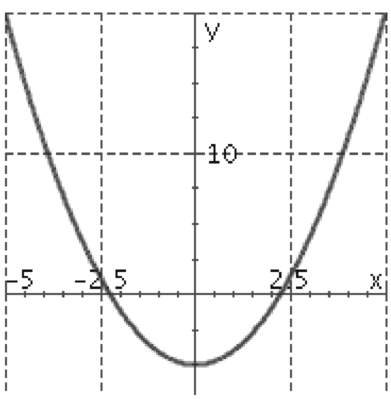
$$y = -2.6x^2 - 15.6x$$

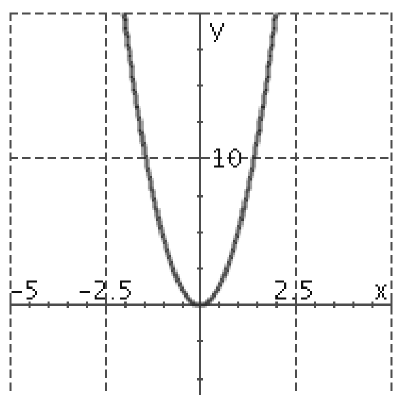
12 Use the discriminant to determine the nature of the solutions of the equation.

$$4x^2 + x + 1 = 0$$

13 Sketch the graph.

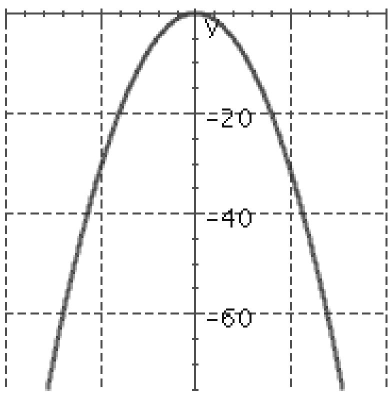
$y = x^2 - 5$

a. 

c. 

..to be continued

continuation

b. 

14 Find the coordinates of the vertex and the intercepts.

$y = x^2 + 4x + 8$

a. No x-intercept; *y*-intercept (0,0); vertex (- 2, 4)

b. No x-intercept; *y*-intercept (- 2, 4); vertex (0, 8)

c. x-intercept (2, 0); *y*-intercept (- 2, 4); vertex (8, 0)

d. No x-intercept; *y*-intercept (8, 0); vertex (- 2, 4)

e. No x-intercept; *y*-intercept (0, 8); vertex (- 2, 4)

15 In the following problem given one solution of a quadratic equation with rational coefficients, find the other solution.

$3 + \sqrt{3}$

a. $x = \dfrac{1}{3 + \sqrt{3}}$

b. $x = -3 - \sqrt{3}$

c. $x = -3 + \sqrt{3}$

d. $x = 3 - \sqrt{3}$

16 Write the following equation in standard form

$$y = 3(x - 5)^2 + 7$$

17 A company can produce *x* lawn mowers for a cost of

$$C = 0.125x^2 + 135000$$

dollars. The sale of the lawn mowers will generate

$$R = 300x$$

dollars in revenue. Find the break-even points by solving a system of equations.

18 Write the equation in standard form.

$$y = -\frac{1}{5}(x + 20)^2 - 2$$

19 Solve the following system algebraically.

$$y = x^2 + 3x + 9$$
$$4y + 5x = -6$$

a. (-1, -6) b. (-7, 3) c. (-3, 7) d. (-2, -8) e. The system has no solution.

20 Find values for *a*, *b*, and *c* so that the graph

$$y = ax^2 + bx + c$$

includes the points (-5, -26), (1, 10) and (4, 1).

Complete the table.

a	
b	
c	

21 The data below show Americans' annual per capita consumption of chicken for several years since 1970.

Age	***Pounds of chicken***
1970	***24.4***
1975	***25.15***
1980	***27***
1985	***29.95***
1989	***33.102***
1990	***34***
1991	***34.942***
1992	***35.928***

Use the values for 1970, 1985, and 1990 to fit a quadratic equation to the data, where *t* is measured in years since 1970.

$$C = at^2 + bt + c$$

22 The table shows the height in kilometers of a star-flare at different times after it exploded from the surface of a star.

Use the linear regression equation to predict the height of the flare 1.4 seconds after it exploded. Find the linear regression equation using the values of $t = 0.4$ and $t = 1.2$.

Time (seconds)	***0.2***	***0.4***	***0.6***	***0.8***	***1.0***	***1.2***
Height (kilometers)	***6.78***	***7.06***	***7.34***	***8.22***	***8.3***	***8.98***

ANSWER KEY

Sample questions On Ch 6

1.

t (in sec)	h (in feet)
0	768
0.5	780
1	784
4.5	588
8	0

2. D,4.3

3. $2x^2+7x-49=0$

4. b

5. $21x^2-25x-4=0$

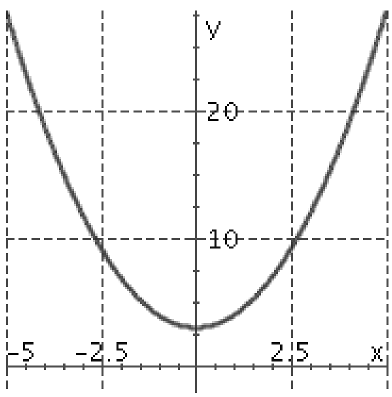
6. $x=-4$

7. b

8. $-0.427, 1.687$

9. $\frac{-9L\pm\sqrt{81L^2+32A}}{16}$

10.



11. (0,0) ,(−6,0)

12. two,complex

13. a

14. e

15. d

16. $y=3x^2-30x+82$

17. (600,180000) ,(1800,540000)

18. $y=-\frac{x^2}{5}-8x-82$

19. e

20.

a	a
b	−1
c	b

21. $0.022t^2+0.04t+24.4$

22. $y=2.4x+6.1$