

Name: _____ Class: _____ Date: _____

Chapter 2**Multiple Choice***Identify the choice that best completes the statement or answers the question.*

- ____ 1. Solve the equation.

$$x^2 + 6x - 4 = 0$$

- a. $x = -3 \pm \sqrt{13}$
- b. $x = 1 \pm \sqrt{17}$
- c. $x = -2 \pm \sqrt{13}$
- d. $x = -3 \pm \sqrt{17}$
- e. The equation has no real roots.

- ____ 2. Solve the equation.

$$5y^2 - 5y - 2 = 0$$

- a. $y = \frac{5 \pm \sqrt{65}}{10}$
- b. $y = \frac{5 \pm \sqrt{67}}{20}$
- c. $y = \frac{-5 \pm \sqrt{65}}{5}$
- d. $y = 5 \pm \sqrt{65}$
- e. $y = \frac{\sqrt{67} \pm 5}{10}$

- ____ 3. Solve the equation.

$$2y^2 - 3y - 3 = 0$$

- a. $y = \frac{3}{4} \pm \sqrt{33}$
- b. $y = \frac{-3 \pm \sqrt{33}}{6}$
- c. $y = \frac{\sqrt{35} \pm 3}{2}$
- d. $y = \frac{3 \pm \sqrt{35}}{3}$
- e. $y = \frac{3 \pm \sqrt{33}}{4}$

_____ 4. Solve the equation.

$$81s^2 + 18s + 1 = 0$$

a. $s = -\frac{1}{9}$

b. $s = -\frac{1}{8}$

c. $s = -\frac{2}{7}$

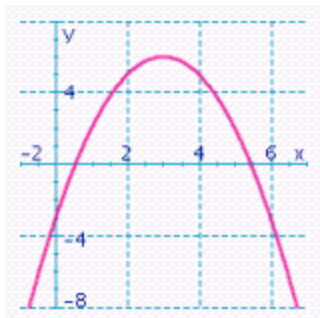
d. $s = -\frac{1}{10}$

e. The equation has no real roots.

5. You are given an equation of the form $y = ax^2 + bx + c$. Determine the exact values of the x -intercepts by using the quadratic formula. Then use a calculator to evaluate the expressions that you obtain. Round the results to four decimal places.

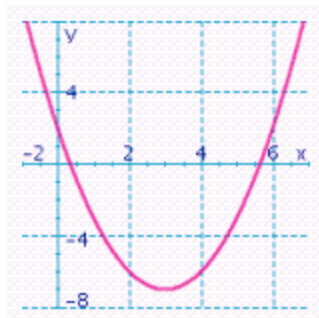
$$y = -x^2 + 6x - 3$$

a.



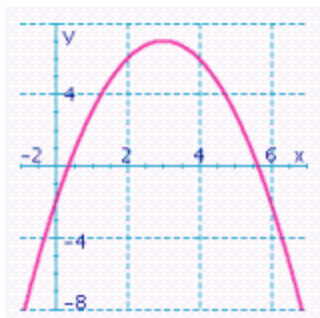
$$x = 3 \pm \sqrt{6} \approx 0.5505, 5.4495$$

d.



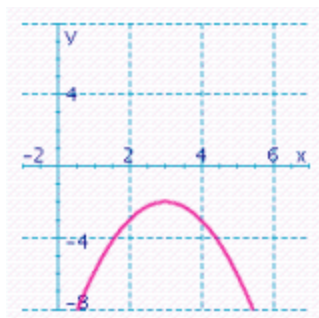
$$x = 3 \pm \sqrt{7} \approx 0.3542, 5.6458$$

b.



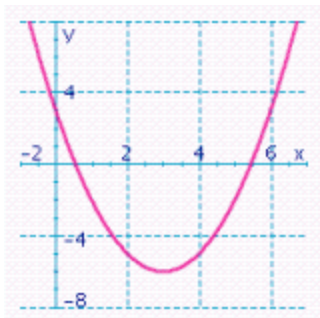
$$x = 3 \pm \sqrt{7} \approx 0.3542, 5.6458$$

e.



The graph has no solutions.

c.



$$x = 3 \pm \sqrt{6} \approx 0.5505, 5.4495$$

6. Find a quadratic equation with the roots of $r_1 = 1 - \sqrt{2}$ and $r_2 = 1 + \sqrt{2}$. Write the answer in the form $ax^2 + bx + c = 0$, where a , b , and c are integers and $a = 1$.

- a. $x^2 + 4x + 1 = 0$
- b. $x^2 - x - 1 = 0$
- c. $x^2 - 2x - 1 = 0$
- d. $x^2 + x - 2 = 0$
- e. $x^2 + 2x - 1 = 0$

7. A ball is thrown straight upward. Suppose that the height of the ball at time t is given by the formula $h = -18t^2 + 126t$, where h is in feet and t is in seconds, with $t = 0$ corresponding to the instant that the ball is first tossed.

At what time(s) does the ball reach a height of 108 ft?

- a. 1 sec, 6sec
- b. 4 sec
- c. 3 sec
- d. 8 sec
- e. 3 sec, 8sec

8. Find all real solutions.

$$3y^2 = 4 - y^4$$

- a. $y = -3, 4, 1$
- b. $y = -4, -1$
- c. $y = 1, -1$
- d. $y = 3, 1$
- e. $y = 3, -4$

9. Find all real solutions.

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

- a. $x = \sqrt{\frac{-1 + \sqrt{17}}{2}}$
- b. $x = \sqrt{\frac{1 - \sqrt{13}}{2}}$
- c. $x = \pm \sqrt{\frac{1 - \sqrt{13}}{2}}$
- d. $x = \pm \sqrt{\frac{-1 \pm \sqrt{17}}{2}}$
- e. $x = \pm \sqrt{\frac{-1 + \sqrt{17}}{2}}$

_____ 10. Find all real solutions.

$$t^{\frac{3}{2}} = 125$$

- a. $t = 25$
- b. $t = \pm 625$
- c. $t = \pm 5$
- d. $t = \pm 25$
- e. $t = 5$

_____ 11. Solve. Express your answer using interval notation.

$$x + 6 < 1$$

- a. $(-\infty, 5)$
- b. $(-\infty, 5]$
- c. $(-\infty, -5]$
- d. $(-5, \infty)$
- e. $(-\infty, -5)$

_____ 12. Solve. Express your answer using interval notation.

$$5x + 7 < 4(x - 1) - x$$

- a. $\left(-\infty, -\frac{2}{11}\right]$
- b. $\left(-\infty, -\frac{2}{11}\right)$
- c. $\left(-\frac{11}{2}, \infty\right)$
- d. $\left(-\frac{2}{11}, 0\right]$
- e. $\left(-\infty, -\frac{11}{2}\right)$

____ 13. Solve. Express your answer using interval notation.

$$\frac{2x+1}{2} - \frac{x-4}{4} < x + \frac{1}{2}$$

- a. $(-\infty, -4)$
- b. $[4, \infty)$
- c. $(-\infty, -4]$
- d. $(4, \infty)$
- e. $(-\infty, 4)$

____ 14. Solve. Express your answer using interval notation.

$$-1 \leq x - 5 \leq 0$$

- a. $(-\infty, 4] \cup [5, \infty)$
- b. $[-5, -4]$
- c. $(4, 5)$
- d. $[4, 0]$
- e. $[4, 5]$

____ 15. Solve. Express your answer using interval notation.

$$-7 \leq 2x + 3 \leq 13$$

- a. $(-\infty, -7] \cup [13, \infty)$
- b. $(-5, 7)$
- c. $[-5, 5)$
- d. $[-5, 5]$
- e. $(-5, 7]$

____ 16. Solve. Express your answer using interval notation.

$$3.99 \leq \frac{x}{3} - 1 \leq 3.999$$

- a. $[14.97, 14.997]$
- b. $[-14.997, -14.97]$
- c. $[-14.997, 14.97]$
- d. $(14.97, 14.997)$
- e. $(-\infty, 14.97] \cup [14.997, \infty)$

____ 17. Solve. Express your answer using interval notation.

$$\frac{9}{10} \leq \frac{7x-1}{-4} \leq \frac{91}{100}$$

- a. $\left[\frac{13}{35}, \frac{66}{175} \right)$
- b. $\left[\frac{13}{35}, \frac{66}{175} \right]$
- c. $\left(-\infty, -\frac{66}{175} \right] \cup \left[-\frac{13}{35}, \infty \right)$
- d. $\left[-\frac{66}{175}, -\frac{13}{35} \right]$
- e. $\left(-\frac{66}{175}, -\frac{13}{35} \right)$

____ 18. Solve. Express your answer using interval notation.

$$3 - x \leq 5$$

- a. $[2, \infty)$
- b. $(2, \infty)$
- c. $[-2, \infty)$
- d. $(-\infty, -2)$
- e. $(-2, \infty)$

____ 19. Solve. Express your answer using interval notation.

$$\left| \frac{2-5x}{2} \right| > 2$$

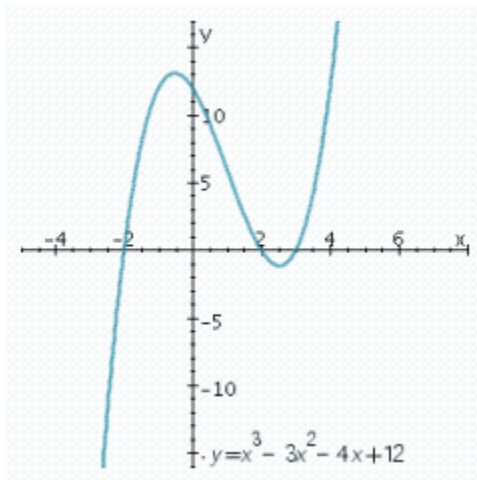
- a. $\left(-\infty, -\frac{2}{5} \right]$
- b. $\left(-\infty, -\frac{2}{5} \right] \cup \left[1\frac{1}{5}, \infty \right)$
- c. $\left(-\infty, -\frac{2}{5} \right) \cup \left(1\frac{1}{5}, \infty \right)$
- d. $\left[-\frac{2}{5}, 1\frac{1}{5} \right]$
- e. $\left(-\frac{2}{5}, 1\frac{1}{5} \right)$

20. Data from the *Apollo 11* moon mission in July Error in evaluating expression: helpvar2 showed temperature readings on the lunar surface varying over the interval $-185^{\circ} \leq C \leq 111^{\circ}$ on the Celsius scale. What is the corresponding interval on the Fahrenheit scale? (Round the numbers you obtain to the nearest integers.) Express your answer using interval notation.

- a. $[-301^{\circ}\text{F}, 301^{\circ}\text{F}]$
- b. $[-275^{\circ}\text{F}, 257^{\circ}\text{F}]$
- c. $[-333^{\circ}\text{F}, 333^{\circ}\text{F}]$
- d. $[-135^{\circ}\text{F}, 94^{\circ}\text{F}]$
- e. $[-301^{\circ}\text{F}, 232^{\circ}\text{F}]$

21. Use the graph to solve the inequality.

$$x^3 - 3x^2 - 4x + 12 \geq 0$$



- a. $(-2, 2) \cup (3, \infty)$
- b. $[-\infty, 3) \cup (2, 3]$
- c. $(-2, 2]$
- d. $[-2, 2] \cup [3, \infty)$
- e. no solution

22. Solve the inequality. Express your answer in interval form.

$$x^2 - 4x + 1 \leq 0$$

- a. $[2, 2 + \sqrt{3}]$
- b. $[-\infty, 2 - \sqrt{3}] \cup [2 + \sqrt{3}, \infty)$
- c. $[2 - \sqrt{3}, 2 + \sqrt{3}]$
- d. $[0, 2 - \sqrt{3}] \cup [2 + \sqrt{3}, 0]$
- e. no solution

____ 23. Solve the inequality. Express your answer in interval form.

$$(x - 4)(x + 2)(x + 9) \geq 0$$

- a. $[-9, -2] \cup [4, \infty)$
- b. $(-\infty, -9] \cup [-2, -4]$
- c. $[-\infty, -9] \cup [2, \infty)$
- d. $[-\infty, -2] \cup [9, \infty)$
- e. no solution

____ 24. Solve the inequality. Express your answer in interval form.

$$(7x - 1)^7 (7x - 3)^9 (7x - 6) > 0$$

- a. $\left(\frac{1}{7}, \frac{3}{7}\right) \cup \left(\frac{6}{7}, \infty\right)$
- b. $\left(\frac{6}{7}, \infty\right)$
- c. $\left(-\frac{3}{7}, -\frac{1}{7}\right) \cup \left(\frac{6}{7}, \infty\right)$
- d. $\left(-\infty, -\frac{1}{7}\right) \cup \left(\frac{1}{7}, \frac{3}{7}\right) \cup \left(\frac{6}{7}, \infty\right)$
- e. no solution

____ 25. Solve the inequality. Express your answer in interval form.

$$\frac{2 - x}{3 - 4x} \geq 0$$

- a. $\left(\frac{3}{4}, 2\right)$
- b. $\left(-\infty, -\frac{3}{4}\right] \cup [2, \infty)$
- c. $\left(-\infty, \frac{3}{4}\right) \cup [2, \infty)$
- d. $\left(-\infty, \frac{3}{4}\right] \cup (2, \infty)$
- e. no solution

Chapter 2

Answer Section

MULTIPLE CHOICE

- | | |
|------------|--------|
| 1. ANS: A | PTS: 1 |
| 2. ANS: A | PTS: 1 |
| 3. ANS: E | PTS: 1 |
| 4. ANS: A | PTS: 1 |
| 5. ANS: A | PTS: 1 |
| 6. ANS: C | PTS: 1 |
| 7. ANS: A | PTS: 1 |
| 8. ANS: C | PTS: 1 |
| 9. ANS: E | PTS: 1 |
| 10. ANS: A | PTS: 1 |
| 11. ANS: E | PTS: 1 |
| 12. ANS: E | PTS: 1 |
| 13. ANS: D | PTS: 1 |
| 14. ANS: E | PTS: 1 |
| 15. ANS: D | PTS: 1 |
| 16. ANS: A | PTS: 1 |
| 17. ANS: D | PTS: 1 |
| 18. ANS: C | PTS: 1 |
| 19. ANS: C | PTS: 1 |
| 20. ANS: E | PTS: 1 |
| 21. ANS: D | PTS: 1 |
| 22. ANS: C | PTS: 1 |
| 23. ANS: A | PTS: 1 |
| 24. ANS: A | PTS: 1 |
| 25. ANS: C | PTS: 1 |

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Chapter 2

Multiple Choice

Identify the choice that best completes the statement or answers the question.

- _____ 1. Solve the equation.

$$x^2 - 6x - 2 = 0$$

- a. $x = 3 \pm \sqrt{11}$
- b. $x = 3 \pm \sqrt{7}$
- c. $x = 2 \pm \sqrt{11}$
- d. $x = -1 \pm \sqrt{7}$
- e. The equation has no real roots.

- _____ 2. Solve the equation.

$$2y^2 - 5y - 1 = 0$$

- a. $y = \frac{-5 \pm \sqrt{33}}{2}$
- b. $y = \frac{5 \pm \sqrt{35}}{8}$
- c. $y = \frac{5 \pm \sqrt{33}}{4}$
- d. $y = \frac{\sqrt{35} \pm 5}{4}$
- e. $y = 5 \pm \sqrt{33}$

- _____ 3. Solve the equation.

$$3y^2 + 3y - 1 = 0$$

- a. $y = \frac{-3 \pm \sqrt{19}}{4}$
- b. $y = \frac{-3}{6} \pm \sqrt{21}$
- c. $y = \frac{\sqrt{19} \pm 3}{3}$
- d. $y = \frac{-3 \pm \sqrt{21}}{6}$
- e. $y = \frac{3 \pm \sqrt{21}}{8}$

4. Solve the equation.

$$9s^2 + 6s + 1 = 0$$

a. $s = -\frac{1}{4}$

b. $s = -\frac{2}{7}$

c. $s = -\frac{1}{3}$

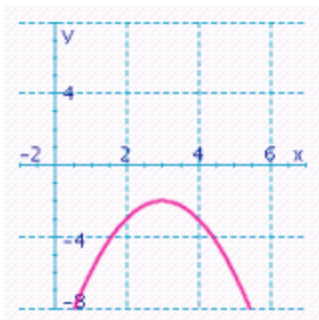
d. $s = -\frac{1}{2}$

e. The equation has no real roots.

5. You are given an equation of the form $y = ax^2 + bx + c$. Determine the exact values of the x -intercepts by using the quadratic formula. Then use a calculator to evaluate the expressions that you obtain. Round the results to four decimal places.

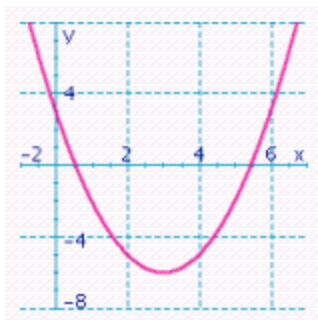
$$y = -x^2 + 6x - 3$$

a.



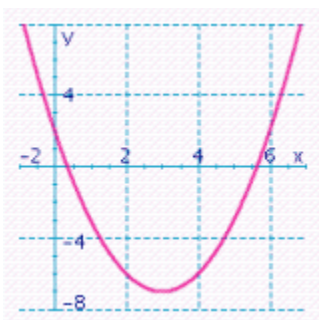
The graph has no solutions.

d.



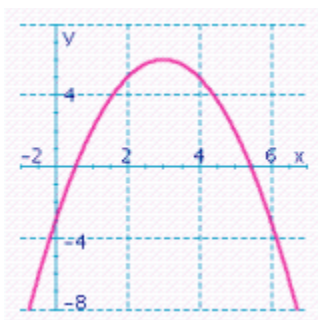
$$x = 3 \pm \sqrt{6} \approx 0.5505, 5.4495$$

b.



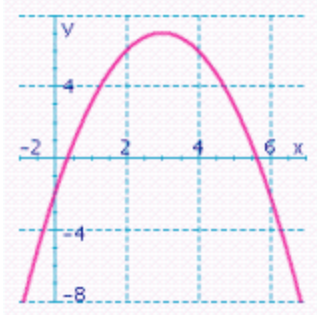
$$x = 3 \pm \sqrt{7} \approx 0.3542, 5.6458$$

e.



$$x = 3 \pm \sqrt{6} \approx 0.5505, 5.4495$$

c.



$$x = 3 \pm \sqrt{7} \approx 0.3542, 5.6458$$

6. Find a quadratic equation with the roots of $r_1 = 1 - \sqrt{7}$ and $r_2 = 1 + \sqrt{7}$. Write the answer in the form $ax^2 + bx + c = 0$, where a , b , and c are integers and $a = 1$.
- $x^2 + 2x - 6 = 0$
 - $x^2 - 2x - 6 = 0$
 - $x^2 + 3x + 6 = 0$
 - $x^2 - x - 6 = 0$
 - $x^2 + x - 7 = 0$
7. A ball is thrown straight upward. Suppose that the height of the ball at time t is given by the formula $h = -13t^2 + 91t$, where h is in feet and t is in seconds, with $t = 0$ corresponding to the instant that the ball is first tossed.

At what time(s) does the ball reach a height of 130 ft?

- 5 sec
 - 3 sec, 6sec
 - 1 sec
 - 2 sec, 5sec
 - 6 sec
8. Find all real solutions.

$$6y^2 = 7 - y^4$$

- $y = 6, -7$
- $y = 6, 1$
- $y = -6, 7, 1$
- $y = 1, -1$
- $y = -7, -1$

_____ 9. Find all real solutions.

$$x^4 + 5x^2 - 1 = 0$$

a. $x = \pm \sqrt{\frac{-5 \pm \sqrt{29}}{2}}$

b. $x = \pm \sqrt{\frac{-5 + \sqrt{29}}{2}}$

c. $x = \sqrt{\frac{5 - \sqrt{37}}{2}}$

d. $x = \sqrt{\frac{-5 + \sqrt{29}}{2}}$

e. $x = \pm \sqrt{\frac{5 - \sqrt{37}}{2}}$

_____ 10. Find all real solutions.

$$t^{\frac{3}{2}} = 8$$

a. $t = 2$

b. $t = \pm 4$

c. $t = 4$

d. $t = \pm 16$

e. $t = \pm 2$

_____ 11. Solve. Express your answer using interval notation.

$$x + 9 < 4$$

a. $(-\infty, 5)$

b. $(-\infty, 5]$

c. $(-5, \infty)$

d. $(-\infty, -5)$

e. $(-\infty, -5]$

____ 12. Solve. Express your answer using interval notation.

$$7x + 37 < 2(x - 1) - x$$

- a. $\left(-\infty, -\frac{13}{2}\right)$
- b. $\left(-\infty, -\frac{2}{13}\right]$
- c. $\left(-\frac{2}{13}, 0\right)$
- d. $\left(-\frac{13}{2}, \infty\right)$
- e. $\left(-\infty, -\frac{2}{13}\right)$

____ 13. Solve. Express your answer using interval notation.

$$\frac{2x+1}{2} - \frac{x-4}{5} < x + \frac{1}{2}$$

- a. $(-\infty, -4]$
- b. $[4, \infty)$
- c. $(4, \infty)$
- d. $(-\infty, -4)$
- e. $(-\infty, 4)$

____ 14. Solve. Express your answer using interval notation.

$$-2 \leq x - 7 \leq 0$$

- a. $(-\infty, 5] \cup [7, \infty)$
- b. $[5, 0]$
- c. $[5, 7]$
- d. $[-7, -5]$
- e. $(5, 7)$

____ 15. Solve. Express your answer using interval notation.

$$-9 \leq 2x + 1 \leq 11$$

- a. $(-5, 9]$
- b. $(-5, 9)$
- c. $[-5, 5)$
- d. $[-5, 5]$
- e. $(-\infty, -9] \cup [11, \infty)$

____ 16. Solve. Express your answer using interval notation.

$$3.99 \leq \frac{x}{2} - 4 \leq 3.999$$

- a. $[15.98, 15.998]$
- b. $[-15.998, 15.98]$
- c. $(-\infty, 15.98] \cup [15.998, \infty)$
- d. $[-15.998, -15.98]$
- e. $(15.98, 15.998)$

____ 17. Solve. Express your answer using interval notation.

$$\frac{9}{10} \leq \frac{3x-1}{-3} \leq \frac{91}{100}$$

- a. $\left[-\frac{173}{300}, -\frac{17}{30}\right]$
- b. $\left[\frac{17}{30}, \frac{173}{300}\right]$
- c. $\left(-\infty, -\frac{173}{300}\right] \cup \left[-\frac{17}{30}, \infty\right)$
- d. $\left[\frac{17}{30}, \frac{173}{300}\right]$
- e. $\left(-\frac{173}{300}, -\frac{17}{30}\right)$

____ 18. Solve. Express your answer using interval notation.

$$5 - x \leq 7$$

- a. $(-2, \infty)$
- b. $(-\infty, -2)$
- c. $[-2, \infty)$
- d. $(2, \infty)$
- e. $[2, \infty)$

____ 19. Solve. Express your answer using interval notation.

$$\left| \frac{6 - 5x}{2} \right| > 4$$

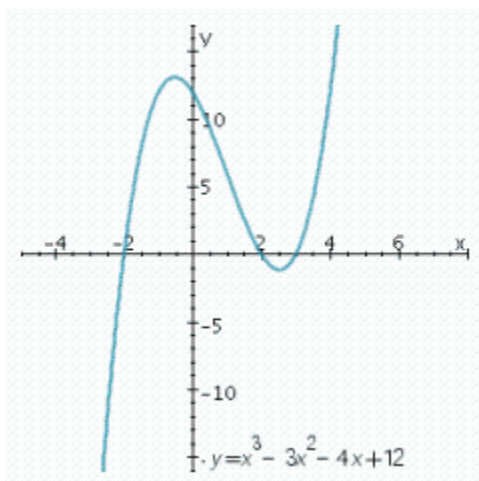
- a. $\left(-\infty, -\frac{2}{5}\right] \cup \left[2\frac{4}{5}, \infty\right)$
- b. $\left(-\infty, -\frac{2}{5}\right) \cup \left(2\frac{4}{5}, \infty\right)$
- c. $\left[-\frac{2}{5}, 2\frac{4}{5}\right]$
- d. $\left(-\infty, -\frac{2}{5}\right]$
- e. $\left(-\frac{2}{5}, 2\frac{4}{5}\right)$

____ 20. Data from the *Apollo 11* moon mission in July Error in evaluating expression: helpvar2 showed temperature readings on the lunar surface varying over the interval $-185^{\circ} \leq C \leq 111^{\circ}$ on the Celsius scale. What is the corresponding interval on the Fahrenheit scale? (Round the numbers you obtain to the nearest integers.) Express your answer using interval notation.

- a. $[-333^{\circ}\text{F}, 333^{\circ}\text{F}]$
- b. $[-301^{\circ}\text{F}, 301^{\circ}\text{F}]$
- c. $[-275^{\circ}\text{F}, 257^{\circ}\text{F}]$
- d. $[-135^{\circ}\text{F}, 94^{\circ}\text{F}]$
- e. $[-301^{\circ}\text{F}, 232^{\circ}\text{F}]$

____ 21. Use the graph to solve the inequality.

$$x^3 - 3x^2 - 4x + 12 \geq 0$$



- a. $[-\infty, 3) \cup (2, 3]$
- b. $(-2, 2) \cup (3, \infty)$
- c. $(-2, 2]$
- d. $[-2, 2] \cup [3, \infty)$
- e. no solution

____ 22. Solve the inequality. Express your answer in interval form.

$$x^2 - 8x + 2 \leq 0$$

- a. $[4, 4 + \sqrt{14}]$
- b. $[0, 4 - \sqrt{14}] \cup [4 + \sqrt{14}, 0]$
- c. $[-\infty, 4 - \sqrt{14}] \cup [4 + \sqrt{14}, \infty)$
- d. $[4 - \sqrt{14}, 4 + \sqrt{14}]$
- e. no solution

____ 23. Solve the inequality. Express your answer in interval form.

$$(x - 2)(x + 2)(x + 8) \geq 0$$

- a. $[-\infty, -2] \cup [8, \infty)$
- b. $[-\infty, -8] \cup [2, \infty)$
- c. $[-8, -2] \cup [2, \infty)$
- d. $(-\infty, -8] \cup [-2, -2]$
- e. no solution

____ 24. Solve the inequality. Express your answer in interval form.

$$(8x - 1)^9 (8x - 3)^5 (8x - 5) > 0$$

- a. $\left(-\infty, -\frac{1}{8}\right) \cup \left(\frac{1}{8}, \frac{3}{8}\right) \cup \left(\frac{5}{8}, \infty\right)$
- b. $\left(-\frac{3}{8}, -\frac{1}{8}\right) \cup \left(\frac{5}{8}, \infty\right)$
- c. $\left(\frac{5}{8}, \infty\right)$
- d. $\left(\frac{1}{8}, \frac{3}{8}\right) \cup \left(\frac{5}{8}, \infty\right)$
- e. no solution

____ 25. Solve the inequality. Express your answer in interval form.

$$\frac{6 - x}{3 - 4x} \geq 0$$

- a. $\left(\frac{3}{4}, 6\right)$
- b. $\left(-\infty, \frac{3}{4}\right] \cup (6, \infty)$
- c. $\left(-\infty, \frac{3}{4}\right) \cup [6, \infty)$
- d. $\left(-\infty, -\frac{3}{4}\right] \cup [6, \infty)$
- e. no solution

Chapter 2

Answer Section

MULTIPLE CHOICE

- | | |
|------------|--------|
| 1. ANS: A | PTS: 1 |
| 2. ANS: C | PTS: 1 |
| 3. ANS: D | PTS: 1 |
| 4. ANS: C | PTS: 1 |
| 5. ANS: E | PTS: 1 |
| 6. ANS: B | PTS: 1 |
| 7. ANS: D | PTS: 1 |
| 8. ANS: D | PTS: 1 |
| 9. ANS: B | PTS: 1 |
| 10. ANS: C | PTS: 1 |
| 11. ANS: D | PTS: 1 |
| 12. ANS: A | PTS: 1 |
| 13. ANS: C | PTS: 1 |
| 14. ANS: C | PTS: 1 |
| 15. ANS: D | PTS: 1 |
| 16. ANS: A | PTS: 1 |
| 17. ANS: A | PTS: 1 |
| 18. ANS: C | PTS: 1 |
| 19. ANS: B | PTS: 1 |
| 20. ANS: E | PTS: 1 |
| 21. ANS: D | PTS: 1 |
| 22. ANS: D | PTS: 1 |
| 23. ANS: C | PTS: 1 |
| 24. ANS: D | PTS: 1 |
| 25. ANS: C | PTS: 1 |

Name: _____ Class: _____ Date: _____

Chapter 2

Multiple Choice

Identify the choice that best completes the statement or answers the question.

- _____ 1. Solve the equation.

$$x^2 - 6x - 5 = 0$$

- a. $x = -1 \pm \sqrt{11}$
- b. $x = 3 \pm \sqrt{14}$
- c. $x = 3 \pm \sqrt{11}$
- d. $x = 2 \pm \sqrt{14}$
- e. The equation has no real roots.

- _____ 2. Solve the equation.

$$2y^2 + 5y - 5 = 0$$

- a. $y = -5 \pm \sqrt{65}$
- b. $y = \frac{\sqrt{67} \pm 5}{4}$
- c. $y = \frac{-5 \pm \sqrt{67}}{2}$
- d. $y = \frac{-5 \pm \sqrt{65}}{4}$
- e. $y = \frac{5 \pm \sqrt{65}}{2}$

- _____ 3. Solve the equation.

$$2y^2 + 3y - 3 = 0$$

- a. $y = \frac{3 \pm \sqrt{33}}{6}$
- b. $y = \frac{-3 \pm \sqrt{33}}{4}$
- c. $y = \frac{\sqrt{31} \pm 3}{2}$
- d. $y = \frac{-3 \pm \sqrt{31}}{3}$
- e. $y = \frac{-3}{4} \pm \sqrt{33}$

4. Solve the equation.

$$9s^2 + 6s + 1 = 0$$

a. $s = -\frac{1}{3}$

b. $s = -\frac{2}{7}$

c. $s = -\frac{1}{2}$

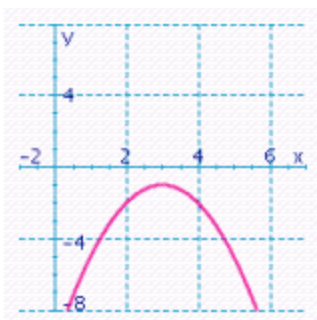
d. $s = -\frac{1}{4}$

e. The equation has no real roots.

5. You are given an equation of the form $y = ax^2 + bx + c$. Determine the exact values of the x -intercepts by using the quadratic formula. Then use a calculator to evaluate the expressions that you obtain. Round the results to four decimal places.

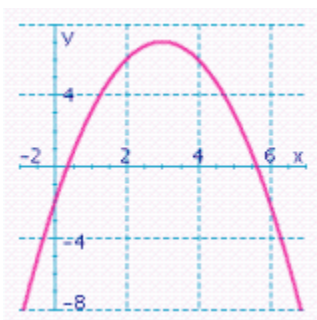
$$y = -x^2 + 6x - 2$$

a.



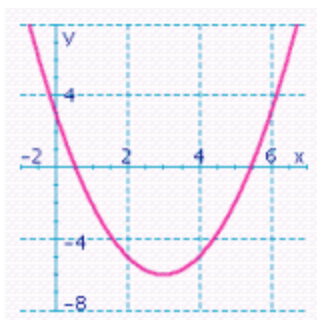
The graph has no solutions.

b.



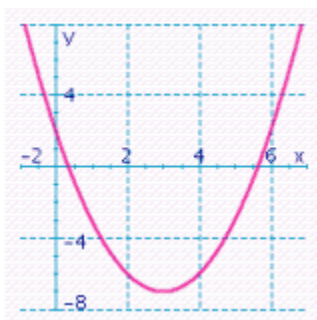
$$x = 3 \pm \sqrt{7} \approx 0.3542, 5.6458$$

d.



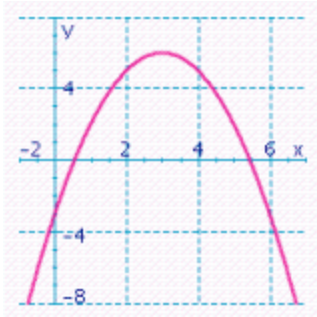
$$x = 3 \pm \sqrt{6} \approx 0.5505, 5.4495$$

e.



$$x = 3 \pm \sqrt{7} \approx 0.3542, 5.6458$$

c.



$$x = 3 \pm \sqrt{6} \approx 0.5505, 5.4495$$

6. Find a quadratic equation with the roots of $r_1 = 1 - \sqrt{2}$ and $r_2 = 1 + \sqrt{2}$. Write the answer in the form $ax^2 + bx + c = 0$, where a , b , and c are integers and $a = 1$.
- $x^2 - 2x - 1 = 0$
 - $x^2 + x - 2 = 0$
 - $x^2 + 3x + 1 = 0$
 - $x^2 - x - 1 = 0$
 - $x^2 + 2x - 1 = 0$
7. A ball is thrown straight upward. Suppose that the height of the ball at time t is given by the formula $h = -13t^2 + 91t$, where h is in feet and t is in seconds, with $t = 0$ corresponding to the instant that the ball is first tossed.

At what time(s) does the ball reach a height of 130 ft?

- 6 sec
 - 3 sec
 - 5 sec
 - 3 sec, 6sec
 - 2 sec, 5sec
8. Find all real solutions.

$$6y^2 = 7 - y^4$$

- $y = -6, 7, 1$
- $y = 6, -7$
- $y = 6, 1$
- $y = 1, -1$
- $y = -7, -1$

_____ 9. Find all real solutions.

$$x^4 + x^2 - 3 = 0$$

a. $x = \pm \sqrt{\frac{-1 \pm \sqrt{13}}{2}}$

b. $x = \pm \sqrt{\frac{1 - \sqrt{41}}{2}}$

c. $x = \sqrt{\frac{-1 + \sqrt{13}}{2}}$

d. $x = \sqrt{\frac{1 - \sqrt{41}}{2}}$

e. $x = \pm \sqrt{\frac{-1 + \sqrt{13}}{2}}$

_____ 10. Find all real solutions.

$$t^{\frac{3}{2}} = 27$$

a. $t = \pm 9$

b. $t = \pm 3$

c. $t = 3$

d. $t = \pm 81$

e. $t = 9$

_____ 11. Solve. Express your answer using interval notation.

$$x + 8 < 2$$

a. $(-\infty, 6]$

b. $(-\infty, -6]$

c. $(-\infty, 6)$

d. $(-\infty, -6)$

e. $(-6, \infty)$

____ 12. Solve. Express your answer using interval notation.

$$9x + 35 < 4(x - 1) - x$$

- a. $\left(-\infty, -\frac{13}{2}\right)$
- b. $\left(-\frac{2}{13}, 0\right)$
- c. $\left(-\infty, -\frac{2}{13}\right)$
- d. $\left(-\infty, -\frac{2}{13}\right]$
- e. $\left(-\frac{13}{2}, \infty\right)$

____ 13. Solve. Express your answer using interval notation.

$$\frac{3x+1}{3} - \frac{x-5}{6} < x + \frac{1}{3}$$

- a. $(-\infty, -5]$
- b. $(-\infty, 5)$
- c. $(-\infty, -5)$
- d. $(5, \infty)$
- e. $[5, \infty)$

____ 14. Solve. Express your answer using interval notation.

$$-3 \leq x - 5 \leq 0$$

- a. $[2, 5]$
- b. $[2, 0]$
- c. $[-5, -2]$
- d. $(2, 5)$
- e. $(-\infty, 2] \cup [5, \infty)$

____ 15. Solve. Express your answer using interval notation.

$$-1 \leq 2x + 3 \leq 7$$

- a. $(-2, 1]$
- b. $(-\infty, -1] \cup [7, \infty)$
- c. $[-2, 2]$
- d. $[-2, 2)$
- e. $(-2, 1)$

____ 16. Solve. Express your answer using interval notation.

$$1.99 \leq \frac{x}{2} - 3 \leq 1.999$$

- a. $(9.98, 9.998)$
- b. $(-\infty, 9.98] \cup [9.998, \infty)$
- c. $[-9.998, -9.98]$
- d. $[-9.998, 9.98]$
- e. $[9.98, 9.998]$

____ 17. Solve. Express your answer using interval notation.

$$\frac{9}{10} \leq \frac{5x-1}{-5} \leq \frac{91}{100}$$

- a. $\left[-\frac{71}{100}, -\frac{7}{10}\right]$
- b. $\left[\frac{7}{10}, \frac{71}{100}\right]$
- c. $\left(-\frac{71}{100}, -\frac{7}{10}\right)$
- d. $\left(-\infty, -\frac{71}{100}\right] \cup \left[-\frac{7}{10}, \infty\right)$
- e. $\left[\frac{7}{10}, \frac{71}{100}\right)$

____ 18. Solve. Express your answer using interval notation.

$$1 - x \leq 7$$

- a. $[6, \infty)$
- b. $(-6, \infty)$
- c. $(6, \infty)$
- d. $(-\infty, -6)$
- e. $[-6, \infty)$

____ 19. Solve. Express your answer using interval notation.

$$\left| \frac{2 - 5x}{2} \right| > 3$$

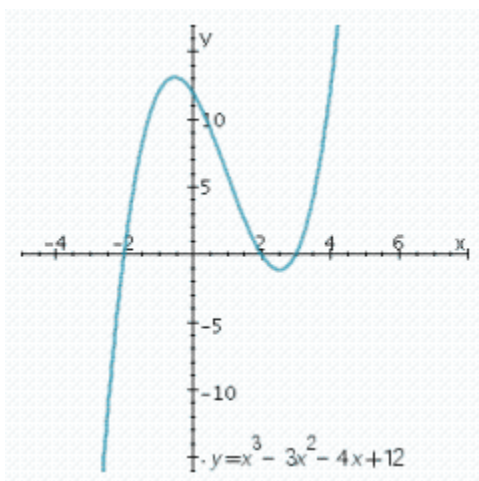
- a. $\left(-\infty, -\frac{4}{5}\right) \cup \left(1\frac{3}{5}, \infty\right)$
- b. $\left[-\infty, -\frac{4}{5}\right] \cup \left[1\frac{3}{5}, \infty\right)$
- c. $\left(-\frac{4}{5}, 1\frac{3}{5}\right)$
- d. $\left(-\infty, -\frac{4}{5}\right]$
- e. $\left[-\frac{4}{5}, 1\frac{3}{5}\right]$

____ 20. Data from the *Apollo 11* moon mission in July Error in evaluating expression: helpvar2 showed temperature readings on the lunar surface varying over the interval $-185^{\circ} \leq C \leq 111^{\circ}$ on the Celsius scale. What is the corresponding interval on the Fahrenheit scale? (Round the numbers you obtain to the nearest integers.) Express your answer using interval notation.

- a. $[-135^{\circ} \text{F}, 94^{\circ} \text{F}]$
- b. $[-301^{\circ} \text{F}, 232^{\circ} \text{F}]$
- c. $[-301^{\circ} \text{F}, 301^{\circ} \text{F}]$
- d. $[-333^{\circ} \text{F}, 333^{\circ} \text{F}]$
- e. $[-275^{\circ} \text{F}, 257^{\circ} \text{F}]$

____ 21. Use the graph to solve the inequality.

$$x^3 - 3x^2 - 4x + 12 \geq 0$$



a. $[-\infty, 3) \cup (2, 3]$

b. $(-2, 2]$

c. $[-2, 2] \cup [3, \infty)$

d. $(-2, 2) \cup (3, \infty)$

e. no solution

____ 22. Solve the inequality. Express your answer in interval form.

$$x^2 - 24x + 6 \leq 0$$

a. $[-\infty, 12 - \sqrt{138}] \cup [12 + \sqrt{138}, \infty)$

b. $[0, 12 - \sqrt{138}] \cup [12 + \sqrt{138}, 0)$

c. $[12, 12 + \sqrt{138}]$

d. $[12 - \sqrt{138}, 12 + \sqrt{138}]$

e. no solution

____ 23. Solve the inequality. Express your answer in interval form.

$$(x - 4)(x + 2)(x + 9) \geq 0$$

a. $[-\infty, -2] \cup [9, \infty)$

b. $[-9, -2] \cup [4, \infty)$

c. $(-\infty, -9] \cup [-2, -4]$

d. $[-\infty, -9] \cup [2, \infty)$

e. no solution

____ 24. Solve the inequality. Express your answer in interval form.

$$(8x - 1)^3 (8x - 3)^5 (8x - 5) > 0$$

- a. $\left(\frac{5}{8}, \infty\right)$
- b. $\left(-\infty, -\frac{1}{8}\right) \cup \left(\frac{1}{8}, \frac{3}{8}\right) \cup \left(\frac{5}{8}, \infty\right)$
- c. $\left(-\frac{3}{8}, -\frac{1}{8}\right) \cup \left(\frac{5}{8}, \infty\right)$
- d. $\left(\frac{1}{8}, \frac{3}{8}\right) \cup \left(\frac{5}{8}, \infty\right)$
- e. no solution

____ 25. Solve the inequality. Express your answer in interval form.

$$\frac{6 - x}{3 - 7x} \geq 0$$

- a. $\left(-\infty, \frac{3}{7}\right) \cup [6, \infty)$
- b. $\left(\frac{3}{7}, 6\right)$
- c. $\left(-\infty, \frac{3}{7}\right] \cup (6, \infty)$
- d. $\left(-\infty, -\frac{3}{7}\right] \cup [6, \infty)$
- e. no solution

Chapter 2

Answer Section

MULTIPLE CHOICE

- | | |
|------------|--------|
| 1. ANS: B | PTS: 1 |
| 2. ANS: D | PTS: 1 |
| 3. ANS: B | PTS: 1 |
| 4. ANS: A | PTS: 1 |
| 5. ANS: B | PTS: 1 |
| 6. ANS: A | PTS: 1 |
| 7. ANS: E | PTS: 1 |
| 8. ANS: D | PTS: 1 |
| 9. ANS: E | PTS: 1 |
| 10. ANS: E | PTS: 1 |
| 11. ANS: D | PTS: 1 |
| 12. ANS: A | PTS: 1 |
| 13. ANS: D | PTS: 1 |
| 14. ANS: A | PTS: 1 |
| 15. ANS: C | PTS: 1 |
| 16. ANS: E | PTS: 1 |
| 17. ANS: A | PTS: 1 |
| 18. ANS: E | PTS: 1 |
| 19. ANS: A | PTS: 1 |
| 20. ANS: B | PTS: 1 |
| 21. ANS: C | PTS: 1 |
| 22. ANS: D | PTS: 1 |
| 23. ANS: B | PTS: 1 |
| 24. ANS: D | PTS: 1 |
| 25. ANS: A | PTS: 1 |

Name: _____ Class: _____ Date: _____

Chapter 2

Multiple Choice

Identify the choice that best completes the statement or answers the question.

- _____ 1. Solve the equation.

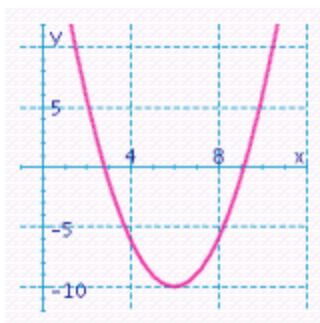
$$5y^2 - 5y - 2 = 0$$

- a. $y = \frac{5 \pm \sqrt{65}}{10}$
b. $y = \frac{5 \pm \sqrt{67}}{20}$
c. $y = \frac{-5 \pm \sqrt{65}}{5}$
d. $y = 5 \pm \sqrt{65}$
e. $y = \frac{\sqrt{67} \pm 5}{10}$

- _____ 2. You are given an equation of the form $y = ax^2 + bx + c$. Determine the exact values of the x -intercepts by using the quadratic formula. Then use a calculator to evaluate the expressions that you obtain. Round the results to four decimal places.

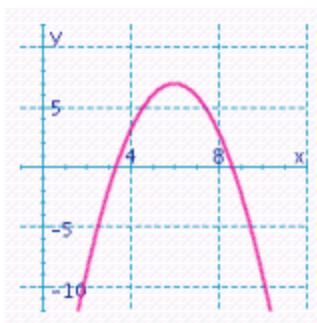
$$y = x^2 - 12x + 26$$

a.



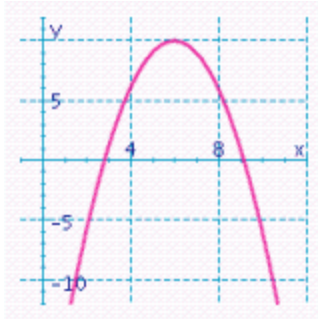
$$x = 6 \pm \sqrt{10} \approx 2.8377, 9.1623$$

d.



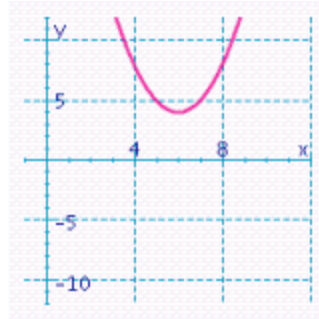
$$x = 6 \pm \sqrt{7} \approx 3.3542, 8.6458$$

b.



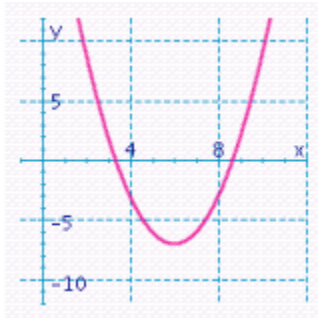
$$x = 6 \pm \sqrt{10} \approx 2.8377, 9.1623$$

e.



The graph has no solutions.

c.



$$x = 6 \pm \sqrt{7} \approx 3.3542, 8.6458$$

3. Find the sum and the product of the roots.

$$x^2 + 9x - 30 = 0$$

- a. sum: - 9 product: - 30
- b. sum: 9 product: - 30
- c. sum: - 30 product: 9
- d. sum: 30 product: 9
- e. sum: - 5 product: 30

4. Find the sum and the product of the roots.

$$2y^2 - 16y + 5 = 0$$

- a. sum: 8; product: $\frac{5}{2}$
- b. sum: 16; product: - 10
- c. sum: - 8; product: $-\frac{5}{2}$
- d. sum: 16; product 5
- e. sum: -8; product: $\frac{5}{2}$

_____ 5. Find the sum and the product of the roots.

$$\frac{1}{4}y^2 = 2y - 5$$

- a. sum: 2 product: 5
- b. sum: -8 product: 20
- c. sum: -2 product: 20
- d. sum: 20 product: -8
- e. sum: 8 product: 20

_____ 6. Determine the number of real roots the equation has.

$$3x^2 - 4x + 7 = 0$$

- a. The equation has one real solution.
- b. The equation has no real solution.
- c. The equation has three real solutions.
- d. The equation has two real solutions.
- e. The equation has four real solutions.

_____ 7. Find all solutions.

$$|x - 5| = 1$$

- a. $x = 6, 4$
- b. $x = 6$
- c. $x = 8, 1$
- d. $x = 1, 3$
- e. $x = 9, 2$

_____ 8. Find all solutions.

$$|x - 6| - 3 = 1$$

- a. $x = 10, 2$
- b. $x = 12, -1$
- c. $x = 13, 0$
- d. $x = 4$
- e. $x = 15, 3$

_____ 9. Find all solutions.

$$|x + 1| = 2x - 2$$

- a. $x = -3$
- b. $x = 4$
- c. $x = 5, 4$
- d. $x = 3$
- e. $x = 0, 3$

_____ 10. Find all real solutions.

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

a. $x = \sqrt{\frac{-1 + \sqrt{17}}{2}}$

b. $x = \sqrt{\frac{1 - \sqrt{13}}{2}}$

c. $x = \pm \sqrt{\frac{1 - \sqrt{13}}{2}}$

d. $x = \pm \sqrt{\frac{-1 \pm \sqrt{17}}{2}}$

e. $x = \pm \sqrt{\frac{-1 + \sqrt{17}}{2}}$

_____ 11. Find all real solutions.

$$t^{\frac{3}{2}} = 125$$

a. $t = 25$

b. $t = \pm 625$

c. $t = \pm 5$

d. $t = \pm 25$

e. $t = 5$

_____ 12. Find all real solutions.

$$\sqrt{1 - 2x} + \sqrt{x + 5} = 4$$

a. $x = -4, -\frac{20}{9}$

b. $x = 2, -\frac{20}{9}$

c. $x = -6, -\frac{20}{9}$

d. $x = -9, 7$

e. no real solutions

____ 13. Solve. Express your answer using interval notation.

$$5x + 7 < 4(x - 1) - x$$

- a. $\left(-\infty, -\frac{2}{11}\right]$
- b. $\left(-\infty, -\frac{2}{11}\right)$
- c. $\left(-\frac{11}{2}, \infty\right)$
- d. $\left(-\frac{2}{11}, 0\right)$
- e. $\left(-\infty, -\frac{11}{2}\right)$

____ 14. Solve. Express your answer using interval notation.

$$\frac{2x+1}{2} - \frac{x-4}{4} < x + \frac{1}{2}$$

- a. $(-\infty, -4)$
- b. $[4, \infty)$
- c. $(-\infty, -4]$
- d. $(4, \infty)$
- e. $(-\infty, 4)$

____ 15. Solve. Express your answer using interval notation.

$$3.99 \leq \frac{x}{3} - 1 \leq 3.999$$

- a. $[14.97, 14.997]$
- b. $[-14.997, -14.97]$
- c. $[-14.997, 14.97]$
- d. $(14.97, 14.997)$
- e. $(-\infty, 14.97] \cup [14.997, \infty)$

____ 16. Solve. Express your answer using interval notation.

$$|x| \leq 5$$

- a. $[-5, 5]$
- b. $[-\infty, 5]$
- c. $[-\infty, 5)$
- d. $(-\infty, -5] \cup [5, \infty)$
- e. $(-5, 5)$

____ 17. Solve. Express your answer using interval notation.

$$\left| \frac{2-5x}{2} \right| > 2$$

- a. $\left(-\infty, -\frac{2}{5}\right]$
- b. $\left(-\infty, -\frac{2}{5}\right] \cup \left[1\frac{1}{5}, \infty\right)$
- c. $\left(-\infty, -\frac{2}{5}\right) \cup \left[1\frac{1}{5}, \infty\right)$
- d. $\left[-\frac{2}{5}, 1\frac{1}{5}\right]$
- e. $\left(-\frac{2}{5}, 1\frac{1}{5}\right)$

____ 18. Data from the *Apollo 11* moon mission in July Error in evaluating expression: helpvar2 showed temperature readings on the lunar surface varying over the interval $-185^{\circ} \leq C \leq 111^{\circ}$ on the Celsius scale. What is the corresponding interval on the Fahrenheit scale? (Round the numbers you obtain to the nearest integers.) Express your answer using interval notation.

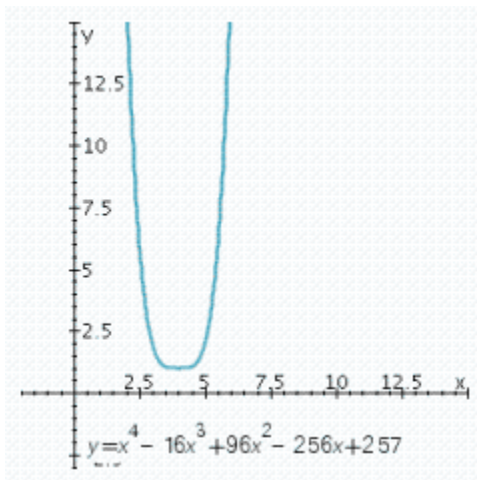
- a. $[-301^{\circ}\text{F}, 301^{\circ}\text{F}]$
- b. $[-275^{\circ}\text{F}, 257^{\circ}\text{F}]$
- c. $[-333^{\circ}\text{F}, 333^{\circ}\text{F}]$
- d. $[-135^{\circ}\text{F}, 94^{\circ}\text{F}]$
- e. $[-301^{\circ}\text{F}, 232^{\circ}\text{F}]$

19. Data from the Mariner 10 spacecraft (launched November 3, 1973) indicate that the surface temperature on the planet Mercury varies over the interval $-170^{\circ} \leq C \leq 400^{\circ}$ on the Celsius scale. What is the corresponding interval on the Fahrenheit scale? (Round the numbers in your answer to the nearest 10°F .) Express your answer using interval notation.

- a. $[-270^{\circ}\text{F}, 760^{\circ}\text{F}]$
- b. $[-270^{\circ}\text{F}, 750^{\circ}\text{F}]$
- c. $[-280^{\circ}\text{F}, 750^{\circ}\text{F}]$
- d. $[-280^{\circ}\text{F}, 730^{\circ}\text{F}]$
- e. $[-280^{\circ}\text{F}, 760^{\circ}\text{F}]$

20. Use the graph to solve the inequality.

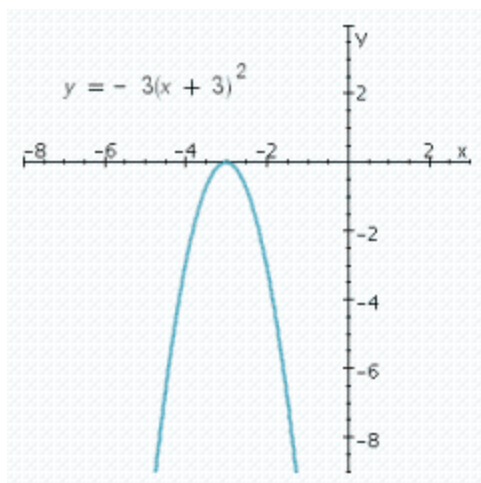
$$x^4 - 16x^3 + 96x^2 - 256x + 257 < 0$$



- a. $(-\infty, \infty)$
- b. $(-\infty, -4)$
- c. $(2, \infty)$
- d. $(-4, 2)$
- e. no solution

____ 21. Use the graph to solve the inequality.

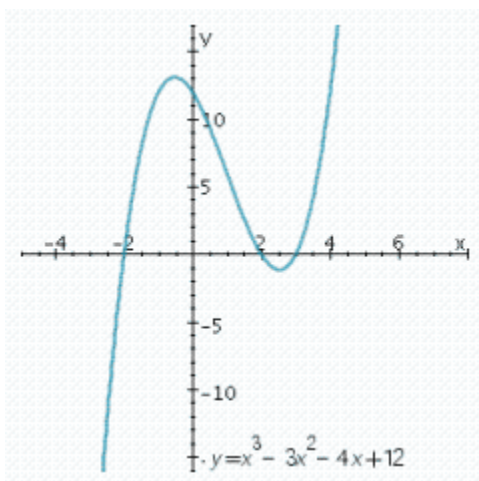
$$-3(x + 3)^2 < 0$$



- a. $(-3, \infty)$
- b. $(-\infty, -3)$
- c. $(-\infty, 3) \cup (3, \infty)$
- d. $(-\infty, -3) \cup (-3, \infty)$
- e. $(-\infty, \infty)$
- f. no solution

_____ 22. Use the graph to solve the inequality.

$$x^3 - 3x^2 - 4x + 12 \geq 0$$



a. $(-2, 2) \cup (3, \infty)$

b. $[-\infty, 3) \cup (2, 3]$

c. $(-2, 2]$

d. $[-2, 2] \cup [3, \infty)$

e. no solution

_____ 23. Solve the inequality. Express your answer in interval form.

$$x^2 - 4x + 1 \leq 0$$

a. $[2, 2 + \sqrt{3}]$

b. $[-\infty, 2 - \sqrt{3}] \cup [2 + \sqrt{3}, \infty)$

c. $[2 - \sqrt{3}, 2 + \sqrt{3}]$

d. $[0, 2 - \sqrt{3}] \cup [2 + \sqrt{3}, 0]$

e. no solution

____ 24. Solve the inequality. Express your answer in interval form.

$$6x^2 - x + 3 \leq 0$$

- a. $(-\sqrt{22}, \sqrt{22})$
- b. $[6 - \sqrt{11}, 6 + \sqrt{11}]$
- c. $(3 - \sqrt{22}, 3 + \sqrt{22})$
- d. $[-2 - \sqrt{14}, -2 + \sqrt{14}]$
- e. no solution

____ 25. Solve the inequality. Express your answer in interval form.

$$\frac{x^2 - 1}{x^2 + 9x + 18} \geq 0$$

- a. $(-6, -3) \cup [1, \infty)$
- b. $(-\infty, -6] \cup [-3, -1] \cup [1, \infty)$
- c. $(-6, -3) \cup [-1, 1]$
- d. $(-\infty, -6) \cup (-3, -1] \cup [1, \infty)$
- e. no solution

Chapter 2

Answer Section

MULTIPLE CHOICE

- | | |
|------------|--------|
| 1. ANS: A | PTS: 1 |
| 2. ANS: A | PTS: 1 |
| 3. ANS: A | PTS: 1 |
| 4. ANS: A | PTS: 1 |
| 5. ANS: E | PTS: 1 |
| 6. ANS: B | PTS: 1 |
| 7. ANS: A | PTS: 1 |
| 8. ANS: A | PTS: 1 |
| 9. ANS: D | PTS: 1 |
| 10. ANS: E | PTS: 1 |
| 11. ANS: A | PTS: 1 |
| 12. ANS: A | PTS: 1 |
| 13. ANS: E | PTS: 1 |
| 14. ANS: D | PTS: 1 |
| 15. ANS: A | PTS: 1 |
| 16. ANS: A | PTS: 1 |
| 17. ANS: C | PTS: 1 |
| 18. ANS: E | PTS: 1 |
| 19. ANS: B | PTS: 1 |
| 20. ANS: E | PTS: 1 |
| 21. ANS: D | PTS: 1 |
| 22. ANS: D | PTS: 1 |
| 23. ANS: C | PTS: 1 |
| 24. ANS: E | PTS: 1 |
| 25. ANS: D | PTS: 1 |

Name: _____ Class: _____ Date: _____

Chapter 2

Multiple Choice

Identify the choice that best completes the statement or answers the question.

_____ 1. Solve the equation.

$$2y^2 - 5y - 2 = 0$$

a. $y = 5 \pm \sqrt{41}$

b. $y = \frac{5 \pm \sqrt{41}}{4}$

c. $y = \frac{-5 \pm \sqrt{41}}{2}$

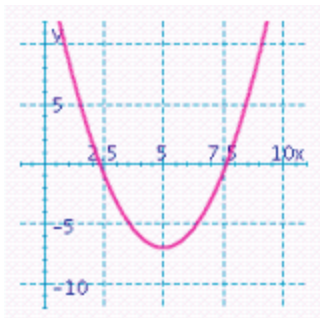
d. $y = \frac{\sqrt{43} \pm 5}{4}$

e. $y = \frac{5 \pm \sqrt{43}}{2}$

2. You are given an equation of the form $y = ax^2 + bx + c$. Determine the exact values of the x -intercepts by using the quadratic formula. Then use a calculator to evaluate the expressions that you obtain. Round the results to four decimal places.

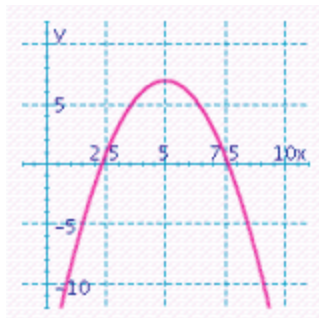
$$y = -x^2 + 10x - 15$$

a.



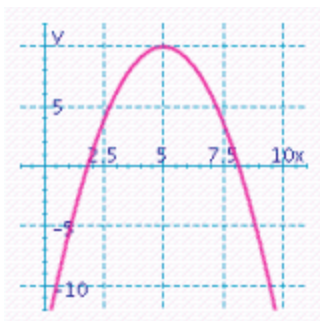
$$x = 5 \pm \sqrt{7} \approx 2.3542, 7.6458$$

d.



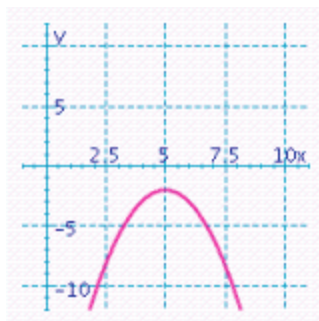
$$x = 5 \pm \sqrt{7} \approx 2.3542, 7.6458$$

b.



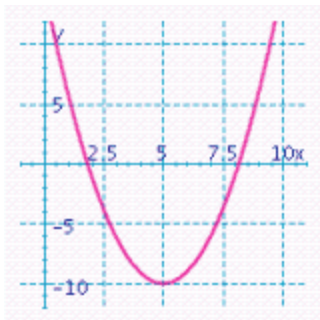
$$x = 5 \pm \sqrt{10} \approx 1.8377, 8.1623$$

e.



The graph has no solutions.

c.



$$x = 5 \pm \sqrt{10} \approx 1.8377, 8.1623$$

- _____ 3. Find the sum and the product of the roots.

$$x^2 + 8x - 10 = 0$$

- a. sum: 10 product: 8
- b. sum: - 10 product: 8
- c. sum: 8 product: - 10
- d. sum: - 4 product: 10
- e. sum: - 8 product: - 10

- _____ 4. Find the sum and the product of the roots.

$$2y^2 - 14y + 9 = 0$$

- a. sum: -7; product: $\frac{9}{2}$
- b. sum: 14; product 9
- c. sum: - 7; product: $-\frac{9}{2}$
- d. sum: 7; product: $\frac{9}{2}$
- e. sum: 14; product: - 18

- _____ 5. Find the sum and the product of the roots.

$$\frac{1}{4}y^2 = 2y - 5$$

- a. sum: 2 product: 5
- b. sum: 20 product: -8
- c. sum: -8 product: 20
- d. sum: 8 product: 20
- e. sum: -2 product: 20

- _____ 6. Determine the number of real roots the equation has.

$$7x^2 - 6x + 5 = 0$$

- a. The equation has no real solution.
- b. The equation has one real solution.
- c. The equation has two real solutions.
- d. The equation has three real solutions.
- e. The equation has four real solutions.

- _____ 7. Find all solutions.

$$|x - 5| = 3$$

- a. $x = 3, 1$
- b. $x = 8, 2$
- c. $x = 6, 5$
- d. $x = 5, 4$
- e. $x = 8$

8. Find all solutions.

$$|x - 3| - 3 = 3$$

- a. $x = 7, 0$
- b. $x = 14, -2$
- c. $x = 6, -1$
- d. $x = 9, -3$
- e. $x = 3$

9. Find all solutions.

$$|x + 4| = 2x - 2$$

- a. $x = 3, 6$
- b. $x = 6$
- c. $x = -6$
- d. $x = 5$
- e. $x = 8, 5$

10. Find all real solutions.

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

- a. $x = \pm \sqrt{\frac{1 - \sqrt{17}}{2}}$
- b. $x = \sqrt{\frac{1 - \sqrt{17}}{2}}$
- c. $x = \pm \sqrt{\frac{-1 + \sqrt{5}}{2}}$
- d. $x = \sqrt{\frac{-1 + \sqrt{5}}{2}}$
- e. $x = \pm \sqrt{\frac{-1 \pm \sqrt{5}}{2}}$

11. Find all real solutions.

$$t^{\frac{3}{2}} = 64$$

- a. $t = 4$
- b. $t = \pm 4$
- c. $t = \pm 16$
- d. $t = 16$
- e. $t = \pm 256$

_____ 12. Find all real solutions.

$$\sqrt{7 - 3x} + \sqrt{x + 4} = 5$$

a. $x = -9, 2$

b. $x = -2, 2$

c. $x = -3, -\frac{7}{4}$

d. $x = 4, -\frac{13}{7}$

e. no real solutions

_____ 13. Solve. Express your answer using interval notation.

$$4x + 12 < 3(x - 1) - x$$

a. $\left(-\frac{15}{2}, \infty\right)$

b. $\left(-\frac{2}{15}, 0\right)$

c. $\left(-\infty, -\frac{2}{15}\right)$

d. $\left(-\infty, -\frac{15}{2}\right)$

e. $\left(-\infty, -\frac{2}{15}\right]$

_____ 14. Solve. Express your answer using interval notation.

$$\frac{3x + 2}{3} - \frac{x - 3}{6} < x + \frac{2}{3}$$

a. $(3, \infty)$

b. $(-\infty, -3]$

c. $[3, \infty)$

d. $(-\infty, 3)$

e. $(-\infty, -3)$

____ 15. Solve. Express your answer using interval notation.

$$1.99 \leq \frac{x}{2} - 2 \leq 1.999$$

- a. $[-7.998, -7.98]$
- b. $[-7.998, 7.98]$
- c. $[7.98, 7.998]$
- d. $(-\infty, 7.98] \cup [7.998, \infty)$
- e. $(7.98, 7.998)$

____ 16. Solve. Express your answer using interval notation.

$$|x| \leq 4$$

- a. $(-\infty, -4] \cup [4, \infty)$
- b. $(-4, 4)$
- c. $[-\infty, 4]$
- d. $[-4, 4]$
- e. $[-\infty, 4)$

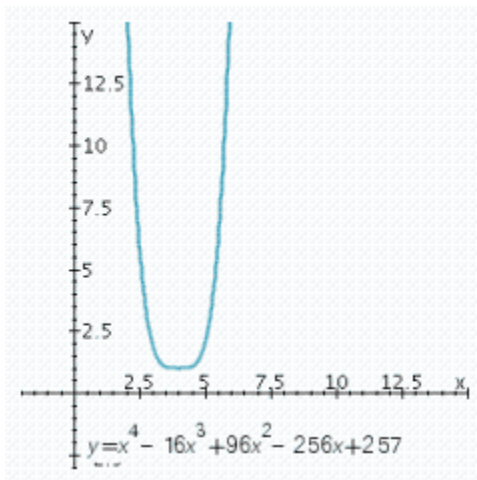
____ 17. Solve. Express your answer using interval notation.

$$\left| \frac{3-4x}{2} \right| > 3$$

- a. $\left(-\frac{3}{4}, 2\frac{1}{4}\right)$
- b. $\left[-\frac{3}{4}, 2\frac{1}{4}\right]$
- c. $\left(-\infty, -\frac{3}{4}\right] \cup \left[2\frac{1}{4}, \infty\right)$
- d. $\left(-\infty, -\frac{3}{4}\right) \cup \left(2\frac{1}{4}, \infty\right)$
- e. $\left(-\infty, -\frac{3}{4}\right]$

18. Data from the *Apollo 11* moon mission in July Error in evaluating expression: helpvar2 showed temperature readings on the lunar surface varying over the interval $-185^{\circ} \leq C \leq 111^{\circ}$ on the Celsius scale. What is the corresponding interval on the Fahrenheit scale? (Round the numbers you obtain to the nearest integers.) Express your answer using interval notation.
- $[-333^{\circ}\text{F}, 333^{\circ}\text{F}]$
 - $[-301^{\circ}\text{F}, 232^{\circ}\text{F}]$
 - $[-301^{\circ}\text{F}, 301^{\circ}\text{F}]$
 - $[-135^{\circ}\text{F}, 94^{\circ}\text{F}]$
 - $[-275^{\circ}\text{F}, 257^{\circ}\text{F}]$
19. Data from the Mariner 10 spacecraft (launched November 3, 1973) indicate that the surface temperature on the planet Mercury varies over the interval $-160^{\circ} \leq C \leq 480^{\circ}$ on the Celsius scale. What is the corresponding interval on the Fahrenheit scale? (Round the numbers in your answer to the nearest 10°F .) Express your answer using interval notation.
- $[-250^{\circ}\text{F}, 900^{\circ}\text{F}]$
 - $[-250^{\circ}\text{F}, 890^{\circ}\text{F}]$
 - $[-250^{\circ}\text{F}, 920^{\circ}\text{F}]$
 - $[-260^{\circ}\text{F}, 890^{\circ}\text{F}]$
 - $[-260^{\circ}\text{F}, 900^{\circ}\text{F}]$
20. Use the graph to solve the inequality.

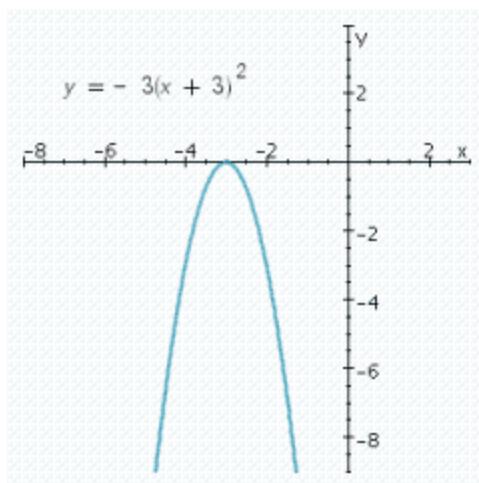
$$x^4 - 16x^3 + 96x^2 - 256x + 257 < 0$$



- $(-\infty, \infty)$
- $(2, \infty)$
- $(-\infty, -4)$
- $(-4, 2)$
- no solution

____ 21. Use the graph to solve the inequality.

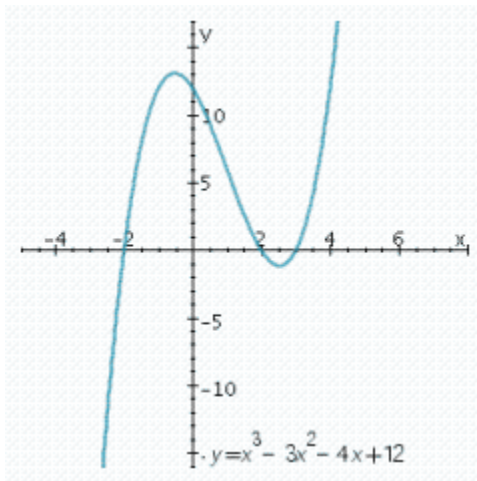
$$-3(x + 3)^2 < 0$$



- a. $(-\infty, 3) \cup (3, \infty)$
- b. $(-\infty, -3) \cup (-3, \infty)$
- c. $(-\infty, \infty)$
- d. $(-3, \infty)$
- e. $(-\infty, -3)$
- f. no solution

____ 22. Use the graph to solve the inequality.

$$x^3 - 3x^2 - 4x + 12 \geq 0$$



- a. $[-2, 2] \cup [3, \infty)$
- b. $[-\infty, 3) \cup (2, 3]$
- c. $(-2, 2]$
- d. $(-2, 2) \cup (3, \infty)$
- e. no solution

____ 23. Solve the inequality. Express your answer in interval form.

$$x^2 - 12x + 3 \leq 0$$

- a. $[6 - \sqrt{33}, 6 + \sqrt{33}]$
- b. $(0, 6 - \sqrt{33}] \cup [6 + \sqrt{33}, 0)$
- c. $(6, 6 + \sqrt{33}]$
- d. $(-\infty, 6 - \sqrt{33}] \cup [6 + \sqrt{33}, \infty)$
- e. no solution

____ 24. Solve the inequality. Express your answer in interval form.

$$5x^2 - x + 6 \leq 0$$

a. $\left[-1 - \sqrt{13}, -1 + \sqrt{13}\right]$

b. $\left(-\sqrt{2}, \sqrt{2}\right)$

c. $\left[5 - \sqrt{2}, 5 + \sqrt{2}\right]$

d. $\left(6 - \sqrt{2}, 6 + \sqrt{2}\right)$

e. no solution

____ 25. Solve the inequality. Express your answer in interval form.

$$\frac{x^2 - 1}{x^2 + 10x + 24} \geq 0$$

a. $(-\infty, -6] \cup [-4, -1] \cup [1, \infty)$

b. $(-6, -4) \cup [-1, 1]$

c. $(-\infty, -6) \cup (-4, -1] \cup [1, \infty)$

d. $(-6, -4) \cup [1, \infty)$

e. no solution

Chapter 2

Answer Section

MULTIPLE CHOICE

- | | |
|------------|--------|
| 1. ANS: B | PTS: 1 |
| 2. ANS: B | PTS: 1 |
| 3. ANS: E | PTS: 1 |
| 4. ANS: D | PTS: 1 |
| 5. ANS: D | PTS: 1 |
| 6. ANS: A | PTS: 1 |
| 7. ANS: B | PTS: 1 |
| 8. ANS: D | PTS: 1 |
| 9. ANS: B | PTS: 1 |
| 10. ANS: C | PTS: 1 |
| 11. ANS: D | PTS: 1 |
| 12. ANS: C | PTS: 1 |
| 13. ANS: D | PTS: 1 |
| 14. ANS: A | PTS: 1 |
| 15. ANS: C | PTS: 1 |
| 16. ANS: D | PTS: 1 |
| 17. ANS: D | PTS: 1 |
| 18. ANS: B | PTS: 1 |
| 19. ANS: E | PTS: 1 |
| 20. ANS: E | PTS: 1 |
| 21. ANS: B | PTS: 1 |
| 22. ANS: A | PTS: 1 |
| 23. ANS: A | PTS: 1 |
| 24. ANS: E | PTS: 1 |
| 25. ANS: C | PTS: 1 |

Name: _____ Class: _____ Date: _____

Chapter 2

Multiple Choice

Identify the choice that best completes the statement or answers the question.

_____ 1. Solve the equation.

$$2y^2 + 7y - 2 = 0$$

a. $y = \frac{\sqrt{67} \pm 7}{4}$

b. $y = -7 \pm \sqrt{65}$

c. $y = \frac{-7 \pm \sqrt{65}}{4}$

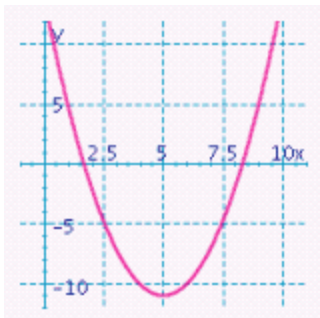
d. $y = \frac{-7 \pm \sqrt{67}}{2}$

e. $y = \frac{7 \pm \sqrt{65}}{2}$

2. You are given an equation of the form $y = ax^2 + bx + c$. Determine the exact values of the x -intercepts by using the quadratic formula. Then use a calculator to evaluate the expressions that you obtain. Round the results to four decimal places.

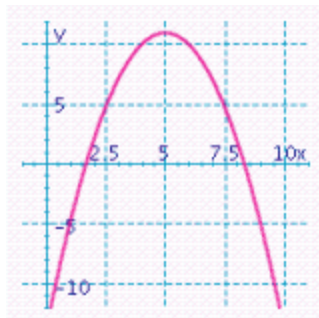
$$y = -x^2 + 10x - 18$$

a.



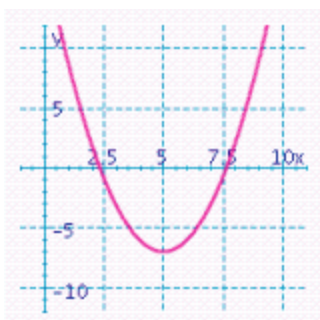
$$x = 5 \pm \sqrt{11} \approx 1.6834, 8.3166$$

d.



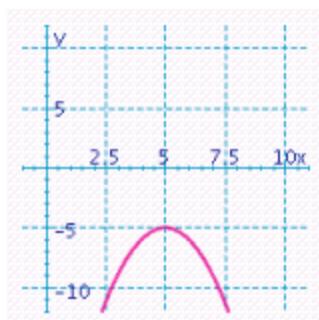
$$x = 5 \pm \sqrt{11} \approx 1.6834, 8.3166$$

b.



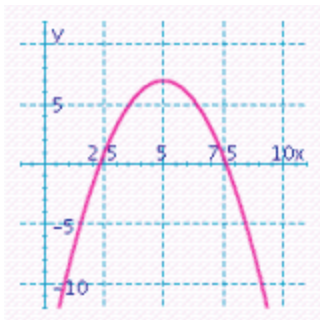
$$x = 5 \pm \sqrt{7} \approx 2.3542, 7.6458$$

e.



The graph has no solutions.

c.



$$x = 5 \pm \sqrt{7} \approx 2.3542, 7.6458$$

- _____ 3. Find the sum and the product of the roots.

$$x^2 + 7x - 30 = 0$$

- a. sum: 15 product: 7
- b. sum: - 7 product: - 30
- c. sum: - 30 product: 7
- d. sum: - 4 product: 30
- e. sum: 7 product: - 30

- _____ 4. Find the sum and the product of the roots.

$$4y^2 - 32y + 3 = 0$$

- a. sum: 32; product 3
- b. sum: -8; product: $\frac{3}{4}$
- c. sum: 8; product: $-\frac{3}{4}$
- d. sum: 8; product: $\frac{3}{4}$
- e. sum: 32; product: - 12

- _____ 5. Find the sum and the product of the roots.

$$\frac{1}{4}y^2 = 2y - 5$$

- a. sum: 8 product: 20
- b. sum: 2 product: 5
- c. sum: -2 product: 20
- d. sum: 20 product: -8
- e. sum: -8 product: 20

- _____ 6. Determine the number of real roots the equation has.

$$8x^2 - 10x + 5 = 0$$

- a. The equation has three real solutions.
- b. The equation has no real solution.
- c. The equation has two real solutions.
- d. The equation has one real solution.
- e. The equation has four real solutions.

- _____ 7. Find all solutions.

$$|x - 7| = 1$$

- a. $x = 5, 8$
- b. $x = 10, 3$
- c. $x = 8, 6$
- d. $x = 8$
- e. $x = 13, 7$

8. Find all solutions.

$$|x - 4| - 3 = 1$$

- a. $x = 2$
- b. $x = 8, 0$
- c. $x = 11, -2$
- d. $x = 13, 1$
- e. $x = 6, 3$

9. Find all solutions.

$$|x + 5| = 3x - 3$$

- a. $x = 2, 3$
- b. $x = 4$
- c. $x = 3$
- d. $x = 7, 4$
- e. $x = -4$

10. Find all real solutions.

$$x^4 + 5x^2 - 1 = 0$$

- a. $x = \pm \sqrt{\frac{5 - \sqrt{13}}{2}}$
- b. $x = \sqrt{\frac{-5 + \sqrt{29}}{2}}$
- c. $x = \sqrt{\frac{5 - \sqrt{13}}{2}}$
- d. $x = \pm \sqrt{\frac{-5 \pm \sqrt{29}}{2}}$
- e. $x = \pm \sqrt{\frac{-5 + \sqrt{29}}{2}}$

11. Find all real solutions.

$$t^{\frac{3}{2}} = 125$$

- a. $t = \pm 25$
- b. $t = \pm 625$
- c. $t = 25$
- d. $t = 5$
- e. $t = \pm 5$

_____ 12. Find all real solutions.

$$\sqrt{7 - 3x} + \sqrt{x + 4} = 5$$

- a. $x = 6, -\frac{13}{7}$
- b. $x = -8, -\frac{20}{9}$
- c. $x = -5, 2$
- d. $x = -3, -\frac{7}{4}$
- e. no real solutions

_____ 13. Solve. Express your answer using interval notation.

$$5x + 3 < 4(x - 1) - x$$

- a. $\left(-\infty, -\frac{2}{7}\right)$
- b. $\left(-\frac{7}{2}, \infty\right)$
- c. $\left(-\infty, -\frac{7}{2}\right)$
- d. $\left(-\infty, -\frac{2}{7}\right]$
- e. $\left(-\frac{2}{7}, 0\right)$

_____ 14. Solve. Express your answer using interval notation.

$$\frac{2x + 1}{2} - \frac{x - 3}{4} < x + \frac{1}{2}$$

- a. $(3, \infty)$
- b. $(-\infty, 3)$
- c. $[3, \infty)$
- d. $(-\infty, -3]$
- e. $(-\infty, -3)$

____ 15. Solve. Express your answer using interval notation.

$$2.99 \leq \frac{x}{2} - 2 \leq 2.999$$

- a. $[-9.998, -9.98]$
- b. $(-\infty, 9.98] \cup [9.998, \infty)$
- c. $(9.98, 9.998)$
- d. $[9.98, 9.998]$
- e. $[-9.998, 9.98]$

____ 16. Solve. Express your answer using interval notation.

$$|x| \leq 3$$

- a. $(-\infty, -3] \cup [3, \infty)$
- b. $[-3, 3]$
- c. $[-\infty, 3)$
- d. $(-3, 3)$
- e. $[-\infty, 3]$

____ 17. Solve. Express your answer using interval notation.

$$\left| \frac{3-5x}{2} \right| > 3$$

- a. $\left(-\frac{3}{5}, 1\frac{4}{5}\right)$
- b. $\left(-\infty, -\frac{3}{5}\right) \cup \left(1\frac{4}{5}, \infty\right)$
- c. $\left(-\infty, -\frac{3}{5}\right]$
- d. $\left[-\frac{3}{5}, 1\frac{4}{5}\right]$
- e. $\left(-\infty, -\frac{3}{5}\right] \cup \left[1\frac{4}{5}, \infty\right)$

18. Data from the *Apollo 11* moon mission in July Error in evaluating expression: helpvar2 showed temperature readings on the lunar surface varying over the interval $-185^{\circ} \leq C \leq 111^{\circ}$ on the Celsius scale. What is the corresponding interval on the Fahrenheit scale? (Round the numbers you obtain to the nearest integers.) Express your answer using interval notation.

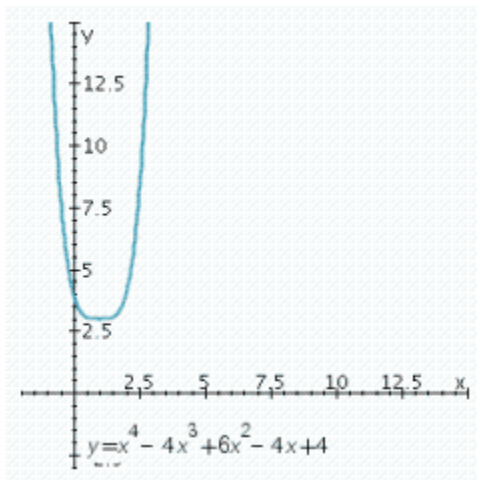
- a. $[-301^{\circ}\text{F}, 301^{\circ}\text{F}]$
- b. $[-301^{\circ}\text{F}, 232^{\circ}\text{F}]$
- c. $[-275^{\circ}\text{F}, 257^{\circ}\text{F}]$
- d. $[-333^{\circ}\text{F}, 333^{\circ}\text{F}]$
- e. $[-135^{\circ}\text{F}, 94^{\circ}\text{F}]$

19. Data from the Mariner 10 spacecraft (launched November 3, 1973) indicate that the surface temperature on the planet Mercury varies over the interval $-140^{\circ} \leq C \leq 490^{\circ}$ on the Celsius scale. What is the corresponding interval on the Fahrenheit scale? (Round the numbers in your answer to the nearest 10°F .) Express your answer using interval notation.

- a. $[-230^{\circ}\text{F}, 910^{\circ}\text{F}]$
- b. $[-220^{\circ}\text{F}, 910^{\circ}\text{F}]$
- c. $[-230^{\circ}\text{F}, 890^{\circ}\text{F}]$
- d. $[-230^{\circ}\text{F}, 900^{\circ}\text{F}]$
- e. $[-220^{\circ}\text{F}, 900^{\circ}\text{F}]$

20. Use the graph to solve the inequality.

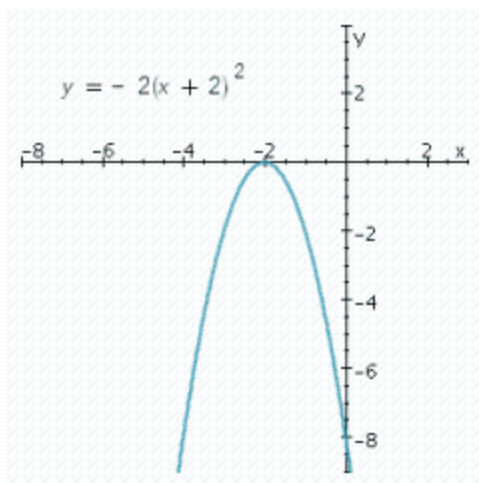
$$x^4 - 4x^3 + 6x^2 - 4x + 4 < 0$$



- a. $(-\infty, \infty)$
- b. $(-\infty, -1)$
- c. $(-1, 3)$
- d. $(3, \infty)$
- e. no solution

____ 21. Use the graph to solve the inequality.

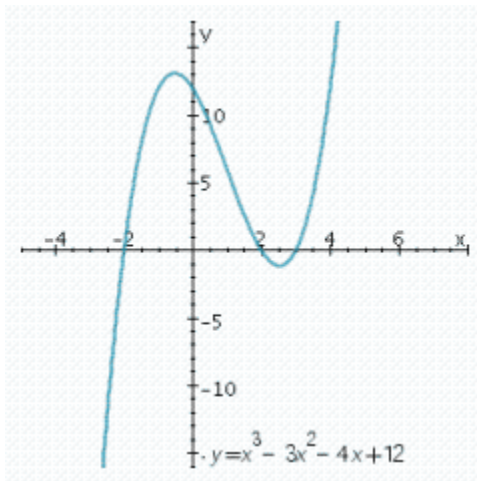
$$-2(x + 2)^2 < 0$$



- a. $(-\infty, \infty)$
- b. $(-\infty, 2) \cup (2, \infty)$
- c. $(-\infty, -2)$
- d. $(-2, \infty)$
- e. $(-\infty, -2) \cup (-2, \infty)$
- f. no solution

____ 22. Use the graph to solve the inequality.

$$x^3 - 3x^2 - 4x + 12 \geq 0$$



- a. $(-2, 2]$
- b. $[-2, 2] \cup [3, \infty)$
- c. $[-\infty, 3) \cup (2, 3]$
- d. $(-2, 2) \cup (3, \infty)$
- e. no solution

____ 23. Solve the inequality. Express your answer in interval form.

$$x^2 - 20x + 5 \leq 0$$

- a. $(-\infty, 10 - \sqrt{95}] \cup [10 + \sqrt{95}, \infty)$
- b. $(0, 10 - \sqrt{95}] \cup [10 + \sqrt{95}, 0)$
- c. $[10, 10 + \sqrt{95}]$
- d. $[10 - \sqrt{95}, 10 + \sqrt{95}]$
- e. no solution

____ 24. Solve the inequality. Express your answer in interval form.

$$3x^2 - x + 3 \leq 0$$

- a. $(-\sqrt{5}, \sqrt{5})$
- b. $(3 - \sqrt{5}, 3 + \sqrt{5})$
- c. $[-1 - \sqrt{11}, -1 + \sqrt{11}]$
- d. $[3 - \sqrt{19}, 3 + \sqrt{19}]$
- e. no solution

____ 25. Solve the inequality. Express your answer in interval form.

$$\frac{x^2 - 1}{x^2 + 9x + 18} \geq 0$$

- a. $(-\infty, -6] \cup [-3, -1] \cup [1, \infty)$
- b. $(-\infty, -6) \cup (-3, -1] \cup [1, \infty)$
- c. $(-6, -3) \cup [-1, 1]$
- d. $(-6, -3) \cup [1, \infty)$
- e. no solution

Chapter 2

Answer Section

MULTIPLE CHOICE

- | | |
|------------|--------|
| 1. ANS: C | PTS: 1 |
| 2. ANS: C | PTS: 1 |
| 3. ANS: B | PTS: 1 |
| 4. ANS: D | PTS: 1 |
| 5. ANS: A | PTS: 1 |
| 6. ANS: B | PTS: 1 |
| 7. ANS: C | PTS: 1 |
| 8. ANS: B | PTS: 1 |
| 9. ANS: B | PTS: 1 |
| 10. ANS: E | PTS: 1 |
| 11. ANS: C | PTS: 1 |
| 12. ANS: D | PTS: 1 |
| 13. ANS: C | PTS: 1 |
| 14. ANS: A | PTS: 1 |
| 15. ANS: D | PTS: 1 |
| 16. ANS: B | PTS: 1 |
| 17. ANS: B | PTS: 1 |
| 18. ANS: B | PTS: 1 |
| 19. ANS: B | PTS: 1 |
| 20. ANS: E | PTS: 1 |
| 21. ANS: E | PTS: 1 |
| 22. ANS: B | PTS: 1 |
| 23. ANS: D | PTS: 1 |
| 24. ANS: E | PTS: 1 |
| 25. ANS: B | PTS: 1 |