

Chapter 6

Multiple Choice

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

1. Solve the equation for t if $0 \leq t < 2\pi$. Give the answer as an exact value in radians. Do not use a calculator.

$$4 \cos t + \sqrt{3} = 2 \cos t$$

- a. $\frac{4\pi}{3}, \frac{5\pi}{3}$
- b. $\frac{5\pi}{6}, \frac{7\pi}{6}$
- c. $\frac{\pi}{4}, \frac{3\pi}{4}$
- d. $\frac{\pi}{4}, \frac{5\pi}{4}$
- e. $\frac{7\pi}{6}, \frac{11\pi}{6}$

2. Solve for x , if $0 \leq x < 2\pi$. Write your answers in exact values only.

$$2 \cos^2 x - \cos x - 1 = 0$$

- a. $\pi, \frac{7\pi}{6}, \frac{11\pi}{6}$
- b. $0, \frac{\pi}{6}, \frac{5\pi}{6}$
- c. $\pi, \frac{2\pi}{3}, \frac{4\pi}{3}$
- d. $0, \frac{2\pi}{3}, \frac{4\pi}{3}$
- e. $0, \frac{7\pi}{6}, \frac{11\pi}{6}$

3. Solve for θ if $0^\circ \leq \theta < 360^\circ$.

$$2 \cos^2 \theta + 11 \cos \theta = -5$$

- a. $60^\circ, 300^\circ$
- b. $150^\circ, 210^\circ$
- c. $30^\circ, 330^\circ$
- d. $210^\circ, 330^\circ$
- e. $120^\circ, 240^\circ$



- ___ 4. Solve for θ if $0^\circ \leq \theta < 360^\circ$.

$$2 \sin^2 \theta - 5 \sin \theta = -2$$

- a. $60^\circ, 300^\circ$
- b. $240^\circ, 300^\circ$
- c. $210^\circ, 330^\circ$
- d. $30^\circ, 150^\circ$
- e. $60^\circ, 120^\circ$

- ___ 5. Find all degree solutions to the equation.

$$\cos(4A - 40^\circ) = -\frac{1}{2}$$

- a. $20^\circ + 90^\circ k, 50^\circ + 90^\circ k$
- b. $5^\circ + 90^\circ k, 20^\circ + 90^\circ k$
- c. $20^\circ + 90^\circ k, 70^\circ + 90^\circ k$
- d. $40^\circ + 90^\circ k, 50^\circ + 90^\circ k$
- e. $40^\circ + 90^\circ k, 70^\circ + 90^\circ k$

- ___ 6. Solve the equation for θ if $0^\circ \leq \theta < 360^\circ$. Give your answer in degrees.

$$2 \cos \theta - \sin 2\theta = 0$$

- a. 90°
- b. $60^\circ, 120^\circ$
- c. $0^\circ, 90^\circ$
- d. $90^\circ, 270^\circ$
- e. $240^\circ, 300^\circ$

- ___ 7. Solve the equation for θ if $0^\circ \leq \theta < 360^\circ$. Give your answer in degrees.

$$2 \cos \theta - 1 = \sec \theta$$

- a. $0^\circ, 120^\circ, 240^\circ$
- b. $30^\circ, 150^\circ, 270^\circ$
- c. $90^\circ, 210^\circ, 330^\circ$
- d. $60^\circ, 180^\circ, 300^\circ$
- e. $150^\circ, 180^\circ, 210^\circ$

8. Solve the equation for x if $0 \leq x < 2\pi$.

$$\cos x - \cos 2x = 0$$

- a. $\frac{\pi}{2}, \frac{7\pi}{6}, \frac{11\pi}{6}$
- b. $\frac{\pi}{6}, \frac{5\pi}{6}, \frac{3\pi}{2}$
- c. $\frac{7\pi}{6}, \frac{3\pi}{2}, \frac{11\pi}{6}$
- d. $0, \frac{2\pi}{3}, \frac{4\pi}{3}$
- e. $\frac{\pi}{3}, \pi, \frac{5\pi}{3}$

9. Solve the equation for x if $0 \leq x < 2\pi$.

$$2 \cos^2 x - \sin x - 1 = 0$$

- a. $\frac{\pi}{2}, \frac{7\pi}{6}, \frac{11\pi}{6}$
- b. $0, \frac{2\pi}{3}, \frac{4\pi}{3}$
- c. $\frac{\pi}{6}, \frac{5\pi}{6}, \frac{3\pi}{2}$
- d. $\frac{\pi}{3}, \pi, \frac{5\pi}{3}$
- e. $\frac{\pi}{6}, \frac{\pi}{2}, \frac{5\pi}{6}$

10. Solve the equation for x if $0 \leq x < 2\pi$.

$$2 \sin x + \cot x = \csc x$$

- a. $\frac{2\pi}{3}, \frac{4\pi}{3}$
- b. $\frac{7\pi}{6}, \frac{11\pi}{6}$
- c. $\frac{\pi}{6}, \frac{5\pi}{6}, \frac{3\pi}{2}$
- d. $\frac{\pi}{6}, \frac{5\pi}{6}$
- e. $\frac{\pi}{3}, \frac{5\pi}{3}$

- ___ 11. Solve the equation for θ if $0^\circ \leq \theta < 360^\circ$.

$$\sqrt{3} \cos \theta + \sin \theta = \sqrt{3}$$

- a. $60^\circ, 300^\circ$
- b. $0^\circ, 60^\circ$
- c. $120^\circ, 240^\circ$
- d. $120^\circ, 180^\circ$
- e. $210^\circ, 270^\circ$

- ___ 12. Solve the equation for θ if $0^\circ \leq \theta < 360^\circ$.

$$\cos \theta - \sqrt{3} \sin \theta = -\sqrt{3}$$

- a. $30^\circ, 90^\circ$
- b. $60^\circ, 120^\circ$
- c. $90^\circ, 150^\circ$
- d. $210^\circ, 270^\circ$
- e. $120^\circ, 240^\circ$

- ___ 13. Find all degree solutions for the equation

$$23 \sec^2 \theta - 17 \tan \theta \sec \theta - 20 = 0 \text{ in the interval } 0^\circ \leq \theta < 360^\circ.$$

- a. $14.5^\circ, 36.7^\circ, 143.3^\circ, 165.5^\circ$
- b. $14.5^\circ, 36.9^\circ, 143.1^\circ, 165.5^\circ$
- c. $14.3^\circ, 36.7^\circ, 143.3^\circ, 165.7^\circ$
- d. $14.1^\circ, 37.3^\circ, 142.7^\circ, 165.9^\circ$
- e. $14.3^\circ, 36.9^\circ, 143.1^\circ, 165.7^\circ$

- ___ 14. Write an expression that gives all solutions to the equation.

$$\cos x - \sin x = \sqrt{2}$$

- a. $\frac{\pi}{4} + 2k\pi$
- b. $\frac{7\pi}{4} + k\pi$
- c. $\frac{\pi}{4} + k\pi$
- d. $\frac{7\pi}{4} + 2k\pi$
- e. $\frac{3\pi}{4} + 2k\pi$

15. Solving the following equation will require you to use the quadratic formula. Solve the equation for θ between 0° and 360° , and round your answers to the nearest tenth of a degree.

$$3 \sin^2 \theta - 2 \cos \theta - 1 = 0$$

- a. $56.1^\circ, 303.9^\circ$
- b. $56.7^\circ, 303.3^\circ$
- c. $57.5^\circ, 302.5^\circ$
- d. $57.1^\circ, 302.9^\circ$
- e. $56.9^\circ, 303.1^\circ$

16. Find all solutions if $0^\circ \leq \theta < 360^\circ$. Verify your answer graphically.

$$\sin 2\theta = \frac{1}{2}$$

- a. $45^\circ, 135^\circ$
- b. $15^\circ, 75^\circ, 195^\circ, 255^\circ, 280^\circ$
- c. $30^\circ, 60^\circ, 210^\circ, 240^\circ$
- d. $15^\circ, 75^\circ, 195^\circ, 255^\circ$
- e. $30^\circ, 60^\circ, 210^\circ, 240^\circ, 260^\circ$

17. Find all solutions if $0 \leq x < 2\pi$. Use exact values only.

$$\sin 2x \cos x + \cos 2x \sin x = \frac{\sqrt{3}}{2}$$

- a. $\frac{\pi}{18}, \frac{5\pi}{18}, \frac{13\pi}{18}, \frac{17\pi}{18}, \frac{25\pi}{18}, \frac{29\pi}{18}$
- b. $\frac{\pi}{12}, \frac{\pi}{4}, \frac{3\pi}{4}, \frac{11\pi}{12}, \frac{17\pi}{12}, \frac{19\pi}{12}$
- c. $0, \frac{\pi}{3}, \frac{2\pi}{3}, \pi, \frac{4\pi}{3}, \frac{5\pi}{3}$
- d. $\frac{\pi}{9}, \frac{2\pi}{9}, \frac{7\pi}{9}, \frac{8\pi}{9}, \frac{13\pi}{9}, \frac{14\pi}{9}$
- e. $\frac{\pi}{6}, \frac{5\pi}{6}, \frac{3\pi}{2}$

18. Find all solutions in radians using exact values only.

$$\cos^2 4x = 1$$

- a. $x = \frac{\pi k}{2}$ or $\frac{\pi}{3} + \frac{\pi k}{2}$
 b. $x = \frac{2\pi k}{3}$ or $\frac{\pi}{3} + \frac{2\pi k}{3}$
 c. $x = \frac{\pi}{3} + 2\pi k$
 d. $x = \frac{2\pi k}{3}$ or $\frac{\pi}{4} + \frac{2\pi k}{3}$
 e. $x = \frac{\pi k}{2}$ or $\frac{\pi}{4} + \frac{\pi k}{2}$

19. Find all solutions if $0^\circ \leq \theta < 360^\circ$. Round your answer to the nearest tenth.

$$\cos^2 3\theta - 3\cos 3\theta + 1 = 0$$

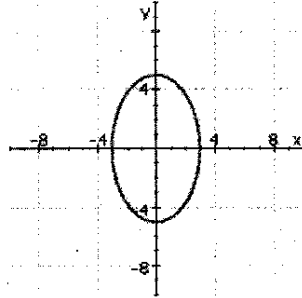
- a. $22.5^\circ, 97.5^\circ, 146.2^\circ, 211.7^\circ, 262.5^\circ, 329.7^\circ$
 b. $23.7^\circ, 95.4^\circ, 142.5^\circ, 217.5^\circ, 265.7^\circ, 337.5^\circ$
 c. $22.5^\circ, 97.5^\circ, 142.5^\circ, 217.5^\circ, 262.5^\circ, 337.5^\circ$
 d. $22.5^\circ, 95.4^\circ, 146.2^\circ, 217.5^\circ, 262.5^\circ, 337.5^\circ$
 e. $23.7^\circ, 97.5^\circ, 142.5^\circ, 211.7^\circ, 265.7^\circ, 337.5^\circ$

20. Eliminate the parameter t from the following and then sketch the graph:

$$x = 3 \sin t \quad y = 5 \cos t$$

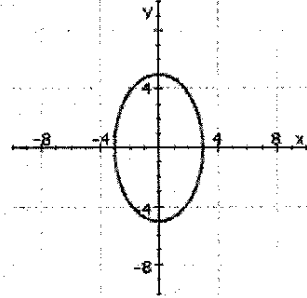
a.

$$\frac{x^2}{9} + \frac{y^2}{25} = 1$$



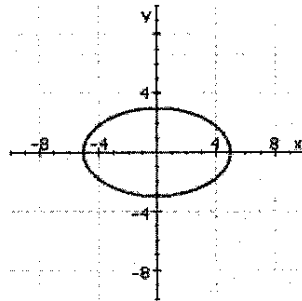
d.

$$\frac{x^2}{9} - \frac{y^2}{25} = 9$$



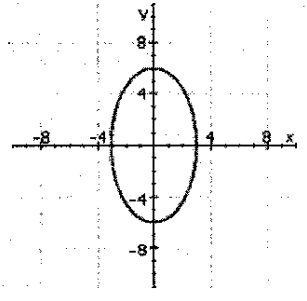
b.

$$\frac{x^2}{9} + \frac{y^2}{25} = 9$$



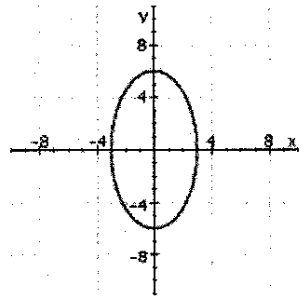
e.

$$\frac{x^2}{9} + \frac{y^2}{36} = 1$$



c.

$$\frac{x^2}{9} + \frac{y^2}{25} = 1$$



21. Eliminate the parameter t in the following:

$$x = \csc t \quad y = \cot t$$

a. $x^2 - \frac{1}{y^2} = 1$

b. $x^2 - \frac{1}{y^2} = 0$

c. $x - y^2 = 1$

d. $x^2 - y^2 = 1$

e. $x^2 + y^2 = 1$

22. Eliminate the parameter t in the following:

$$x = \cot t \quad y = \sec t$$

a. $1 - \frac{1}{x^2} = y^2$

b. $1 + \frac{1}{x^2} = y^2$

c. $1 + x^2 = y^2$

d. $1 - x^2 = y^2$

e. $1 + \frac{1}{x^2} = y$

23. Eliminate the parameter t in the following:

$$x = 5 + 2 \tan t \quad y = 4 + 2 \sec t$$

a. $\frac{(y-4)^2}{4} - \frac{(x-5)^2}{4} = 1$

b. $\frac{(y-5)^2}{4} + \frac{(x-5)^2}{3} = 1$

c. $\frac{(y-4)^2}{4} - \frac{(x-4)^2}{6} = 1$

d. $\frac{(y-4)^2}{4} - \frac{(x-5)^2}{3} = 1$

e. $\frac{(y-5)^2}{4} + \frac{(x-5)^2}{4} = 1$

24. Eliminate the parameter t in the following:

$$x = -\cos 2t \quad y = \cos t$$

a. $x = 2y^2 - 1, -1 \leq x \leq 1, -1 \leq y \leq 1$

b. $x = 2y^2 + 1, -1 \leq x \leq 1, -1 \leq y \leq 1$

c. $x = 2y + 1, -1 \leq x \leq 1, -1 \leq y \leq 1$

d. $x = -2y^2 + 1, -1 \leq x \leq 1, -1 \leq y \leq 1$

e. $x = -2y + 1, -1 \leq x \leq 1, -1 \leq y \leq 1$

25. Eliminate the parameter t in the following:

$$x = -\sin t \quad y = -\sin t$$

- a. $x = -y, -1 \leq x \leq 1, -1 \leq y \leq 1$
- b. $x = 4 - y, -1 \leq x \leq 1, -1 \leq y \leq 1$
- c. $x = 4 + y, -1 \leq x \leq 1, -1 \leq y \leq 1$
- d. $x = 5 + y, -1 \leq x \leq 1, -1 \leq y \leq 1$
- e. $x = y, -1 \leq x \leq 1, -1 \leq y \leq 1$

Chapter 6
Answer Section

MULTIPLE CHOICE

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

Chapter 6

Multiple Choice

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

- ____ 1. Solve the equation for t if $0 \leq t < 2\pi$. Give the answer as an exact value in radians. Do not use a calculator.

$$4 \cos t + \sqrt{3} = 2 \cos t$$

- a. $\frac{4\pi}{3}, \frac{5\pi}{3}$
 - b. $\frac{\pi}{4}, \frac{5\pi}{4}$
 - c. $\frac{5\pi}{6}, \frac{7\pi}{6}$
 - d. $\frac{\pi}{4}, \frac{3\pi}{4}$
 - e. $\frac{7\pi}{6}, \frac{11\pi}{6}$
- ____ 2. Solve for x , if $0 \leq x < 2\pi$. Write your answers in exact values only.

$$2 \cos^2 x - \cos x - 1 = 0$$

- a. $\pi, \frac{7\pi}{6}, \frac{11\pi}{6}$
 - b. $0, \frac{7\pi}{6}, \frac{11\pi}{6}$
 - c. $\pi, \frac{2\pi}{3}, \frac{4\pi}{3}$
 - d. $0, \frac{\pi}{6}, \frac{5\pi}{6}$
 - e. $0, \frac{2\pi}{3}, \frac{4\pi}{3}$
- ____ 3. Solve for θ if $0^\circ \leq \theta < 360^\circ$.

$$2 \cos^2 \theta + 11 \cos \theta = 6$$

- a. $60^\circ, 300^\circ$
- b. $120^\circ, 240^\circ$
- c. $30^\circ, 150^\circ$
- d. $150^\circ, 210^\circ$
- e. $30^\circ, 330^\circ$