PRECALCULUS EXAM REVIEW CHAPTERS 6 - 11

Chapter 6

Write the letter for the correct answer in the blank at the right of each problem.

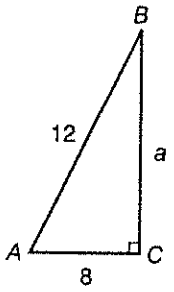
1. Change 128.433° to degrees, minutes, and seconds.
A. 128° 25′ 58″ **B.** 128° 25′ 59″ **C.** 128° 25′ 92″ **D.** 128° 26′ 00″

2. Write 43° 18′ 35″ as a decimal to the nearest thousandth of a degree.
A. 43.306° **B.** 43.308° **C.** 43.309° **D.** 43.310°

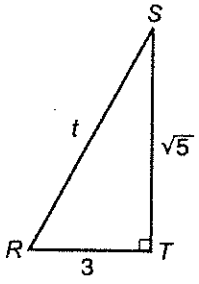
3. Identify all coterminal angles between −360° and 360° for the angle −420°.
A. −60° and 300° **B.** −30° and 330°
C. 30° and −330° **D.** 60° and −300°

4. Find the measure of the reference angle for 1046°.
A. −56° **B.** 56° **C.** 34° **D.** −34°

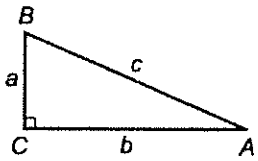
5. Find the value of the tangent for $\angle A$.
A. $\frac{2\sqrt{5}}{2}$ **B.** $\frac{\sqrt{5}}{2}$
C. $\frac{2}{3}$ **D.** $\frac{\sqrt{5}}{3}$



6. Find the value of the secant for $\angle R$.
A. $\frac{\sqrt{70}}{5}$ **B.** $\frac{3\sqrt{14}}{14}$
C. $\frac{\sqrt{5}}{3}$ **D.** $\frac{\sqrt{14}}{3}$



7. Given the triangle at the right, find B to the nearest tenth of a degree if $b = 10$ and $c = 14$.
A. 44.4° **B.** 35.5°
C. 54.5° **D.** 45.6°



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8. Change 1400° to radian measure in terms of π.
A. $\frac{70\pi}{9}$ **B.** $\frac{35\pi}{9}$ **C.** $\frac{140\pi}{9}$ **D.** None of these

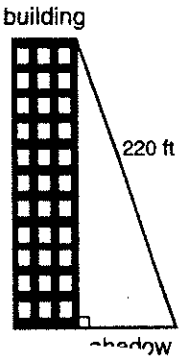
9. Change $\frac{29\pi}{37}$ radians to degree measure.
A. 5220° **B.** 141.1° **C.** 167.6° **D.** 66.6°

10. Find the exact value of sec 300°.
A. −2 **B.** $-\frac{2\sqrt{3}}{3}$ **C.** 2 **D.** $\frac{2\sqrt{3}}{3}$

11. Find the value of csc θ for angle θ in standard position if the point at (5, −2) lies on its terminal side.
A. $-\frac{\sqrt{29}}{2}$ **B.** $-\frac{2\sqrt{29}}{29}$ **C.** $\frac{\sqrt{29}}{5}$ **D.** $\frac{5\sqrt{29}}{29}$

12. Suppose θ is an angle in standard position whose terminal side lies in Quadrant II. If $\sin\theta = \frac{12}{13}$, find the value of sec θ.
A. $-\frac{5}{13}$ **B.** $-\frac{13}{5}$ **C.** $-\frac{12}{5}$ **D.** $\frac{13}{12}$

refer to the figure. The angle of elevation from the end of the shadow to the top of the building is 63° and the distance is 220 feet.



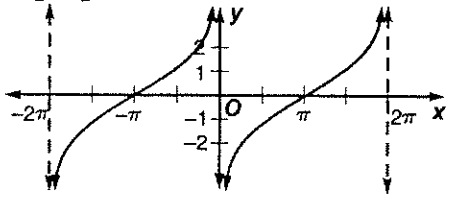
13. Find the height of the building to the nearest foot.
A. 100 ft **B.** 196 ft
C. 432 ft **D.** 112 ft

14. If $0° \le x \le 360°$, solve the equation $\sec x = -2$.
A. 150° and 210° **B.** 210° and 330°
C. 120° and 240° **D.** 240° and 300°

Chapter 7

Chapter 8

15. What is the equation of the graph shown below?
A. $y = \tan \frac{x}{2}$
B. $y = -\cot 2x$
C. $y = -\cot \frac{x}{2}$
D. $y = \tan 2x$



16. State the amplitude, period, and phase shift of the function $y = -3 \cos\left(3x + \frac{3\pi}{2}\right)$.
A. $3; 2\pi; -\frac{\pi}{2}$ **B.** $3; \frac{2\pi}{3}; -\frac{\pi}{2}$ **C.** $-3; 2\pi; \frac{\pi}{2}$ **D.** $3; \frac{2\pi}{3}; \frac{3\pi}{2}$

17. Evaluate $\tan\left(\text{Cos}^{-1} \frac{\sqrt{3}}{2} + \text{Tan}^{-1} \frac{\sqrt{3}}{3}\right)$.
A. $\frac{\sqrt{3}}{3}$ **B.** $\sqrt{3}$ **C.** 0 **D.** undefined

18. Find the values of x for which the equation $\sin x = -1$ is true.
A. $2\pi n$ **B.** $\frac{\pi}{2} + 2\pi n$ **C.** $\pi + 2\pi n$ **D.** $\frac{3\pi}{2} + 2\pi n$

19. Solve $4 \sin^2 x + 4\sqrt{2} \cos x - 6 = 0$ for all real values of x.
A. $\frac{3\pi}{4} + 2\pi k, \frac{5\pi}{4} + 2\pi k$ **B.** $\frac{\pi}{4} + 2\pi k, \frac{7\pi}{4} + 2\pi k$
C. $\frac{\pi}{4} + 2\pi k, \frac{5\pi}{4} + 2\pi k$ **D.** $\frac{3\pi}{4} + 2\pi k, \frac{7\pi}{4} + 2\pi k$

20. Solve $2 \cos^2 x - 5 \cos x + 2 = 0$ for principal values of x.
A. 0° and 30° **B.** 30° **C.** 60° **D.** 60° and 300°

Chapter 9

21. Find an expression equivalent to $\frac{\sec \theta \tan \theta}{\sin \theta}$.
A. $\sec^2 \theta$ **B.** $\cot \theta$ **C.** $\tan^2 \theta$ **D.** $\cos^2 \theta$

22. Simplify $\frac{\tan^2 \theta \csc^2 \theta - 1}{\tan^2 \theta}$.
A. $\csc^2 \theta$ **B.** -1 **C.** $\tan^2 \theta$ **D.** 1

23. Use a sum or difference identity to find the exact value of $\sin 255°$.

A. $\frac{-\sqrt{2}-\sqrt{6}}{4}$ B. $\frac{\sqrt{6}-\sqrt{2}}{4}$ C. $\frac{\sqrt{6}+\sqrt{2}}{4}$ D. $\frac{\sqrt{2}-\sqrt{6}}{4}$

23½. Find the value of $\tan(\alpha - \beta)$ if $\cos\alpha = -\frac{3}{5}$, $\sin\beta = \frac{5}{13}$, $90° < \alpha < 180°$, and $90° < \beta < 180°$

A. $\frac{63}{56}$ B. $-\frac{63}{56}$ C. $-\frac{33}{56}$ D. $\frac{33}{56}$

24. If $\cos\theta = 0.8$ and $270° < \theta < 360°$, find the exact value of $\sin 2\theta$.

A. -0.96 B. -0.6 C. 0.96 D. 0.28

25. If $\csc\theta = -\frac{5}{3}$ and θ has its terminal side in Quadrant III, find the exact value of $\tan 2\theta$.

A. $\frac{24}{25}$ B. $\frac{7}{25}$ C. $\frac{24}{7}$ D. $-\frac{7}{25}$

26. Use a half-angle identity to find the exact value of $\cos 165°$.

A. $\frac{1}{2}\sqrt{2+\sqrt{3}}$ B. $-\frac{1}{2}\sqrt{2+\sqrt{3}}$

C. $\frac{1}{2}\sqrt{2+\sqrt{2}}$ D. $-\frac{1}{2}\sqrt{1+\sqrt{3}}$

hapter 10

27. In $\triangle ABC$, $A = 27° 35'$, $B = 78° 23'$, and $c = 19$. Find a.

A. 8.6 B. 9.2 C. 12.8 D. 19.4

28. In $\triangle ABC$, $A = 47°$, $b = 12$, and $c = 8$. Find a.

A. 6.3 B. 8.7 C. 8.8 D. 18.4

29. In $\triangle ABC$, $a = 7.8$, $b = 4.2$, and $c = 3.9$. Find B.

A. 15.1° B. 148.7° C. 78.9° D. 16.2°

30. Determine the number of possible solutions if $A = 62°$, $a = 4$, and $b = 6$.

A. none B. one C. two D. three

31. If $A = 42.2°$, $B = 13.6°$, and $a = 41.3$, find the area of $\triangle ABC$.

A. 138.8 units^2 B. 493.8 units^2 C. 327.4 units^2 D. 246.9 units^2

32. If $a = 22$, b = 14, and $c = 30$, find the area of $\triangle ABC$.

A. 33 units^2 B. 121.0 units^2 C. 130.2 units^2 D. 143.8 units^2

33. Find the polar coordinates of the point with rectangular coordinates $(-2, 2\sqrt{3})$.

A. $\left(4, \frac{\pi}{3}\right)$ B. $\left(4, \frac{2\pi}{3}\right)$ C. $\left(4, \frac{5\pi}{6}\right)$ D. $\left(2, \frac{2\pi}{3}\right)$

Find the rectangular coordinates of the point with polar coordinates $\left(4, \frac{5\pi}{4}\right)$.

34. A. $(-2\sqrt{2}, -2\sqrt{2})$ B. $(2, 2\sqrt{3})$

C. $(2\sqrt{2}, 2\sqrt{2})$ D. $(-2\sqrt{3}, -2)$

35. Express $5\sqrt{3} - 5i$ in polar form.

A. $10\left(\cos \frac{11\pi}{6} + i \sin \frac{11\pi}{6}\right)$ B. $10\left(\cos \frac{11\pi}{6} - i \sin \frac{11\pi}{6}\right)$

C. $5\left(\cos \frac{11\pi}{6} + i \sin \frac{11\pi}{6}\right)$ D. $10\left(\cos \frac{5\pi}{3} + i \sin \frac{5\pi}{3}\right)$

36. Express $4\left(\cos \frac{3\pi}{4} + i \sin \frac{3\pi}{4}\right)$ in rectangular form.

A. $-\sqrt{2} + \sqrt{2}i$ B. $2\sqrt{2} - 2\sqrt{2}i$

C. $-2\sqrt{2} - 2\sqrt{2}i$ D. $-2\sqrt{2} + 2\sqrt{2}i$

For Exercises 17 and 18, let $z_1 = 8(\cos \frac{2\pi}{3} + i \sin \frac{2\pi}{3})$ and $z_2 = 0.5\left(\cos \frac{\pi}{3} + i \sin \frac{\pi}{3}\right)$.

37. Write the rectangular form of $z_1 z_2$.

A. $-4i$ B. 4 C. $4 + 4i$ D. -4

38. Write the rectangular form of $\frac{z_1}{z_2}$.

A. $8 + 8\sqrt{3}i$ B. $-8 + 8\sqrt{3}i$ C. $16 + 16\sqrt{3}i$ D. $8 - 8\sqrt{3}i$

39. Simplify $(3\sqrt{3} + 3i)^{-3}$ and express the result in rectangular form.

A. $-216i$ B. $-\frac{1}{216}i$ C. $\frac{1}{216}i$ D. $216i$

40. The vector $\vec{v}$ has a magnitude of 89.7 feet and a direction of 12° 48′. Find the magnitude of its vertical component.

A. 887.47 ft B. 19.87 ft C. 19.38 ft D. 87.58 ft

41. Find the ordered pair that represents the vector from $A(-4.3, -0.9)$ to $B(-2.8, 0.2)$. Then find the magnitude of $\overline{AB}$.

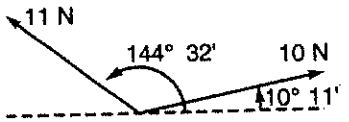
A. $\langle 1.5, 1.1\rangle$; 3.46 B. $\langle -7.1, -0.7\rangle$; 7.13

C. $\langle 1.5, 1.1\rangle$; 1.86 D. $\langle -7.1, -1.1\rangle$; 7.18

42. Find an ordered pair to represent $\vec{u}$ in $\vec{u} = \frac{3}{4}\vec{w} - 2\vec{v}$ if $\vec{w} = \left\langle -\frac{2}{3}, 4\right\rangle$ and $\vec{v} = \left\langle \frac{3}{8}, -2\right\rangle$.

A. $\left\langle \frac{1}{4}, 7\right\rangle$ B. $\left\langle \frac{5}{4}, -1\right\rangle$ C. $\left\langle -\frac{1}{4}, 4\right\rangle$ D. $\left\langle -\frac{5}{4}, 7\right\rangle$

43. Find the magnitude and direction of the resultant vector for the diagram at the right.



A. 8.2 N, 73° 35′ B. 20 N, 18° 37′

C. 6.5 N, 79° 7′ D. 8.2 N, 83° 48′

Write the letter for the correct answer in the blank at the right of each problem.

Exercises 44–45 refer to the ellipse represented by $9x^2 + 16y^2 - 18x + 64y - 71 = 0$.

44. Find the coordinates of the center.

A. (1, 2) B. (1, −2) C. (−1, 2) D. (−2, 1)

Chapter 11

45. Find the coordinates of the foci.

A. $(1 \pm \sqrt{7}, -2)$ B. $(1, -2 \pm \sqrt{7})$

C. (5, −2), (−3, −2) D. (1, 4), (1, −8)

46. Write the standard form of the equation of the circle that passes through the points at (4, 5), (−2, 3), and (−4, −3).

A. $(x-5)^2+(y+4)^2=49$ **B.** $(x-3)^2+(y+2)^2=50$

C. $(x+4)^2+(y-2)^2=36$ **D.** $(x-2)^2+(y+2)^2=25$

47. Find parametric equations for the rectangular equation $(x+2)^2=4(y-1)$.

A. $x=t, y=t^2+2, -\infty<t<\infty$

B. $x=t, y=\frac{1}{4}t^2+t+2, -\infty<t<\infty$

C. $x=t, y=\frac{1}{4}t^2-t+2, -\infty<t<\infty$

D. $x=t, y=4t^2+t+2, -\infty<t<\infty$

Exercises 48–50 refer to the hyperbola represented by $-2x^2+y^2+4x+6y=-3$.

48. Write the equations of the asymptotes.

A. $y+3=\pm 2(x-1)$ **B.** $y+3=\pm\frac{1}{2}(x-1)$

C. $y+3=\pm\sqrt{2}(x-1)$ **D.** $y+3=\pm\frac{\sqrt{2}}{2}(x-1)$

49. Find the coordinates of the foci.

A. $(1\pm\sqrt{2}, -3)$ **B.** $(1\pm\sqrt{6}, -3)$ **C.** $(1, -3\pm\sqrt{2})$ **D.** $(1, -3\pm\sqrt{6})$

50. Write the standard form of the equation of the hyperbola for which the transverse axis is 4 units long and the coordinates of the foci are $(1, -4\pm\sqrt{7})$.

A. $\frac{(x-1)^2}{3}-\frac{(y+4)^2}{4}=1$ **B.** $\frac{(y+4)^2}{4}-\frac{(x-1)^2}{3}=1$

C. $\frac{(y+4)^2}{3}-\frac{(x-1)^2}{4}=1$ **D.** $\frac{(x-1)^2}{4}-\frac{(y+4)^2}{3}=1$

51. Find the coordinates of the vertex and the equation of the axis of symmetry for the parabola represented by $x^2+4x-6y+10=0$.

A. $(-2, 1), y=1$ **B.** $(1, -2), y=-2$

C. $(-2, 1), x=-2$ **D.** $(1, -2), x=1$

52. Write the standard form of the equation of the parabola whose directrix is $x=-1$ and whose focus is at $(5, -2)$.

A. $(y+2)^2=12(x+2)$ **B.** $y-2=12(x+2)^2$

C. $x+2=\frac{1}{12}(y+2)^2$ **D.** $x-2=\frac{1}{12}(y+2)^2$

53. Identify the conic section represented by $9y^2+4x^2-108y+24x=-144$.

A. parabola **B.** hyperbola **C.** ellipse **D.** circle