1. What is the radian measure of an angle whose degree measure is 75°?
   a) \( \frac{12}{5\pi} \)  
   b) \( \frac{5\pi}{12} \)  
   c) \( \frac{\pi}{5} \)  
   d) \( \frac{5}{12} \)  
   e) \( \frac{7\pi}{5} \)

2. In the figure to the right, the measures of the angles are given in degrees. What is the measure of angle C?
   a) 15°  
   b) 120°  
   c) 75°  
   d) 10°  
   e) 105°

3. One solution to \( z^2 + 144 = 0 \) is
   a) 12  
   b) \(-12i\)  
   c) -144  
   d) 144i  
   e) -12

4. \( \sqrt{25x^6y^{14} - 25y^{14}} = \)
   a) \( 5y^7\sqrt{x^6 - 1} \)  
   b) \( 5y^7\sqrt{x^6 - 1} \)  
   c) \( 25x^3y^7 - 25y^7 \)  
   d) \( 5x^3y^7 \)  
   e) \( 5x^3y^7 - 5y^7 \)

5. \( (-27a^{12}b^3c^{-6})^{1/3} = \)
   a) \( \frac{3a^4b}{c^2} \)  
   b) \(-3a^4bc^2 \)  
   c) \( -\frac{9a^4b}{c^2} \)  
   d) \( -\frac{3a^4b}{c^2} \)  
   e) \( \frac{c^2}{3a^4b} \)

6. \( \left( \frac{x^2 - 4x - 5}{x^2 - 49} \right) \div \left( \frac{2x + 2}{7 - x} \right) = \)
   a) \( \frac{x - 5}{x + 7} \)  
   b) \(-\frac{1}{2(x + 7)} \)  
   c) \( -\frac{x - 5}{2(x + 7)} \)  
   d) \( \frac{x + 5}{2(x + 7)} \)  
   e) \( -\frac{2(x - 5)}{x + 7} \)

7. If \( \tan \theta = \frac{12}{5} \) and \( 0 \leq \theta \leq \frac{\pi}{2} \), then \( \sec \theta = \)
   a) \( \frac{13}{12} \)  
   b) \( \frac{13}{5} \)  
   c) \( \frac{5}{12} \)  
   d) \( \frac{5}{13} \)  
   e) \( \frac{1}{13} \)

8. By completing the square, \( x^2 + 26x - 6 = \)
   a) \( (x + 13)^2 - 175 \)  
   b) \( (x - 169)^2 - 163 \)  
   c) \( (x + 13)^2 - 163 \)  
   d) \( (x - 13)^2 + 175 \)  
   e) \( (x - 13)^2 + 163 \)
9. What is the distance between the points (3, 8) and (−8, −1)?

a) $\sqrt{202}$  b) $\sqrt{40}$  c) $\sqrt{74}$  d) 10  e) $\sqrt{170}$

10. $\frac{1}{x-13} + \frac{17}{(x-13)^2} = \frac{18(x+1)}{(x-13)^2}$

a) $\frac{18(x+1)}{(x-13)^2}$  b) $\frac{(x+4)(x+1)}{(x-13)}$  c) $\frac{18}{(x-13)^2(x+1)}$  d) $\frac{17}{(x-13)(x+1)}$

11. Angle $ABC$ in the figure to the right is a right angle. What is $x$?

a) $\frac{3}{4}$  b) 40  c) $\sqrt{40}$

d) $\sqrt{28}$  e) 7

12. Lines $l_1$ and $l_2$ are parallel. Line $l_3$ is perpendicular to $l_2$. Which of the following is NOT true?

a) Line $l_3$ is perpendicular to $l_1$.

b) If line $l_4$ is perpendicular to $l_3$, then $l_4$ is parallel to $l_1$.

c) If line $l_4$ is parallel to $l_3$, then $l_4$ is parallel to $l_1$.

d) Line $l_1$ intersects $l_3$.

e) If line $l_4$ is not perpendicular to $l_3$, then $l_4$ intersects $l_2$.

13. Which of the following can NOT be a root of the polynomial $x^4 - 7x^3 - 4x^2 + 52x + 48$?

a) $-1$  b) 6  c) $-2$

d) 1  e) 4

14. In the right triangle $ABC$ as shown to the right, the length of $AB$ is 10 and the measure of angle $ACB$ is $x$ degrees. What is the length of $BC$?

a) $\frac{1}{10} \tan x$  b) $10 \sin x$  c) $10 \cot x$

d) $\frac{1}{10} \sin x$  e) $10 \tan x$

15. $\log_c b = 9$ means

a) $c^9 = 9$  b) $b^9 = c$  c) $b^c = 9$  d) $c^a = b$  e) $9^b = c$
16. The inequality \(x^2 - 10x < -21\) is equivalent to which of the following?

   a) \(-7 < x < -3\)  
   b) \(x < 3 \text{ or } x > 7\)  
   c) \(x < -7 \text{ or } x > -3\)  
   d) \(0 < x < 10\)  
   e) \(3 < x < 7\)

17. The point \((-2, 7)\) is reflected across the \(y\)-axis, shifted down 3 units, then reflected across the line \(y = x\). What are the coordinates of the resulting point?

   a) \((7, -2)\)  
   b) \((2, 4)\)  
   c) \((4, -2)\)  
   d) \((4, 2)\)  
   e) \((-2, 4)\)

18. In the trapezoid to the right, \(AB\) is parallel to \(CD\) and perpendicular to \(BC\). If the area of the trapezoid is 126, what is the length of \(BC\)?

   a) \(\frac{126}{13}\)  
   b) 18  
   c) \(\frac{42}{5}\)  
   d) \(\sqrt{85}\)  
   e) 9

19. \(\frac{\sqrt{64x}}{\sqrt{64x}} = \)

   a) \(\frac{1}{\sqrt{x}}\)  
   b) \(8\sqrt{x}\)  
   c) \(\frac{1}{2}\)  
   d) \(\frac{\sqrt{x}}{2}\)  
   e) \(\frac{1}{2\sqrt{x}}\)

20. In the figure to the right, \(AB\) is the diameter of the circle with center \(O\). If the length of \(OC\) is 15 and the length of \(BC\) is 24, what is the length of \(AC\)?

   a) 18  
   b) 15  
   c) \(\sqrt{351}\)  
   d) 17  
   e) 20

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

   a) \(\frac{256}{xy^7}\)  
   b) \(\frac{y^9}{256x^5}\)  
   c) \(\frac{1}{16x^9y^7}\)  
   d) \(256xy^9\)  
   e) \(\frac{256x}{y^9}\)

22. The absolute value inequality \(\left|\frac{6 - x}{4}\right| > 5\) is equivalent to

   a) \(x < -14 \text{ or } x > 26\)  
   b) \(-26 < x < 14\)  
   c) \(-14 < x < 26\)  
   d) \(-20 < x < 20\)  
   e) \(x < -14 \text{ and } x > 26\)
23. If \( \log_5 (x + 13) = 2 \log_5 7 \), then \( x = \)
   a) 4  
   b) 36  
   c) -6  
   d) 62  
   e) 30

24. If \( f(x) = |x| \) and \( g(x) = x^3 - 5x - 6 \), then \( (f \circ g)(-2) = \)
   a) -4  
   b) -12  
   c) 4  
   d) -8  
   e) 8

25. One root of \( 9x^2 - 3x - 4 \) is
   a) \(-\frac{3 - \sqrt{153}}{18}\)  
   b) \(-\frac{3 + \sqrt{153}}{18}\)  
   c) \(-\frac{3 + \sqrt{153}}{18}\)  
   d) \(\frac{3 + \sqrt{153}}{18}\)  
   e) \(\frac{3 - \sqrt{153}}{2}\)

26. Leslie is in the center of a circular track of radius 60 feet watching Katrina and Jensine run a race. When Katrina wins, Leslie notices that the angle formed by drawing a line from the center of the track to Katrina and a line from the center of the track to Jensine measures \( \frac{\pi}{4} \) radians. How far, in feet, behind Katrina is Jensine when Katrina wins?
   a) 240  
   b) 15\pi  
   c) \(\frac{\pi}{2}\)  
   d) 60\pi  
   e) \(\frac{\pi}{4}\)

27. In the triangle \( ABC \) to the right, the length of \( AB \) is equal to the length of \( BC \). What is \( x \)?
   a) \(\frac{15}{2}\)  
   b) \(\frac{75}{4}\)  
   c) \(\frac{165}{16}\)  
   d) \(\frac{165}{8}\)  
   e) \(\frac{15}{8}\)

28. If \( \log_9 (x^2 - 28) - \log_9 x = \frac{1}{2} \), then \( x = \)
   a) \(\sqrt{28}\)  
   b) 7  
   c) 4  
   d) \(\frac{1 + \sqrt{125}}{2}\)  
   e) -4 and 7

29. Leslie has a square garden plot of area \( A \) square feet. If she decides to expand her garden by doubling the length of each side, what is the area of her new garden?
   a) \(2A\)  
   b) \((A + 2)^2\)  
   c) \(2A^2\)  
   d) \(4A\)  
   e) \(4A^2\)
30. If \( 4^x \cdot 4^{x+15} = 64^{x-4/3} \), then \( x = \)

a) \(-\frac{4}{3}\)  

b) 11  

c) 19  

d) \(\frac{19}{3}\)  

e) \(-12 + \sqrt{128}\)

31. A store has a 50-inch television on sale. This distance is the diagonal distance across the screen. The ratio of the base of the screen to the height is 4/3. What is the length of the base of the screen?

a) \(\frac{250}{3}\)  

b) 30  

c) \(\frac{200}{2}\)  

d) 40  

e) \(\frac{125}{2}\)

32. \(\frac{x}{x + 11y} + \frac{13y}{x - 11y} = \)

a) \(\frac{2x - 11y}{x + 24y}\)  

b) \(\frac{x^2 + 13xy + 132y}{x^2 - 121y^2}\)  

c) \(\frac{x + 13y}{2x}\)  

d) \(\frac{2x - 11y}{x^2 - 121y^2}\)  

e) \(\frac{x^2 + 2xy + 143y^2}{x^2 - 121y^2}\)

33. If \(\log_3 x - \log_3 (x + 2) = \log_3 15\), then \( x = \)

a) \(-5\) and 3  

b) \(\frac{17}{2}\)  

c) \(-\frac{15}{7}\)  

d) \(\frac{15}{7}\)  

e) No solution

34. The equation of the line that is parallel to the line \(y = \frac{4}{5}x - 2\) and contains the point (5, -2) is

a) \(y = -\frac{5}{4}x + \frac{17}{4}\)  

b) \(y = \frac{4}{5}x - 6\)  

c) \(y = \frac{4}{5}x - \frac{1}{5}\)  

d) \(y = \frac{4}{5}x + \frac{8}{5}\)  

e) \(y = \frac{4}{5}x + 6\)

35. If \(f(x) = \sqrt{-6x + 30}\), then \(f(-3 + h) = \)

a) \(-6h\sqrt{48}\)  

b) \(\sqrt{-6h + 30}\)  

c) \(\sqrt{h} + 48\)  

d) \(h + \sqrt{48}\)  

e) \(\sqrt{-6h} + 48\)

36. The figure to the right is composed of three congruent squares. If the total area of the figure is 75, find the perimeter.

a) 60  

b) 20  

c) 40  

d) 5  

e) 225