

Answers

1. D
2. C
3. D
4. A
5.a. D
b. C
6. A
7. B
8. C
9. C
10. C
11. D
12. D
13. $\log_{10}100$
 $\ln 100$
Same
 $10 \times \log_{10}10$
 $10 + \log_{10}10$
14. $4x(x+5)(x-6)$
15. D
16. B
17. B
18. B
19. D
20. D
21. A
22. A
23. B
24. $(-4, 1)$ (see sol'n below)
25. A
26. B
27. B
28. $x = 1, 1.4$ (see solution below)
29. A
30. C
31. A
32. D
33. B
34.a. C
b. A
35. D
36. D
37. D
38. B
39. D
40. $\log_{10}100 = 2$
 $\log_3 243 = 5$
 $\log_9 729 = 3$
41.a. C
b. D
42.a. $f(X) = \$20,000 - X(0.18 \times \$20,000)$
b. 3 years (see solution below)
43. Center: $(2, -6)$
Vertices: $(-3, -6)$ & $(7, -6)$
Co-vertices: $(2, -9)$ & $(2, -3)$
Foci: $(-2, -6)$ & $(6, -6)$
44. $f(x) = 2^x$; $f(6) = 64$
45. 9 5
46. 61'' (More than 1, but less than 2, SD from the mean)
47. A
48. $x = 10, y = -6$ (see solution below)
49. C
50. factors: $(x-2)(x+6)$; zeros = 2, -6

Solutions

24. The slope of the radius of the first circle $(\Delta X/\Delta Y) = 5/3$. Since the second circle has the same area and is tangent at point (1,4), its radius must have the same slope as it extends from point (1,4) to the center. This puts the center at (-4,1)

28.

Quadratic formula:

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

$$a = -5$$

$$b = 12$$

$$c = -7$$

$$x = \frac{-12 \pm \sqrt{(12)^2 - 4(35)}}{2(-5)} = \frac{-12 \pm \sqrt{144 - 140}}{-10}$$

$$= \frac{-12 \pm \sqrt{4}}{-10} = \frac{-12 \pm 2}{-10} = \frac{-14}{-10}, \frac{-10}{-10} = 1.4, 1$$

42.b. Yearly decrease in value = $0.18 (\$20,000) = \$3600/\text{yr}$

Car will be worth less than $\frac{1}{2}$ original value when
 $\$3600/\text{yr} \times X\text{yrs} > \$10,000$.

At this point, $X > \$10,000/\$3600/\text{yr} = 2.77$ yrs.

48.

$$\begin{bmatrix} -9 & -7 \\ -3 & -1 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} -132 \\ -24 \end{bmatrix}$$

Inverse of the A =

$$\begin{bmatrix} -1/30 & -7/30 \\ 1/10 & -3/10 \end{bmatrix}$$

$$X = 10, Y = -6$$