for Introductory Physics

Answers

1. CHOICE D: We are given $x - 1 = 2$. To solve for x, add 1 to both sides of the equation:

$x – 1 = 2$
$+ 1 = + 1$

$x = 3$

so $x + 1 = (3 + 1) = 4$

2. CHOICE B: volume = ″ $R^2 h$ = (3)(2 cm)^2 (5 cm) = 60 cm^3

3. CHOICE C: If $x = 3$ then $x^2 + 3 = 3^2 + 3 = 9 + 3 = 12$

4. CHOICE C: The area is 8 entire squares plus 0.8 + 0.4 + 0.9 + 0.1 + 0.5 squares which is 10.7 squares. Each square has an area of so the total area is about 53.5.

5. CHOICE A: (-2)(-6) / --------- = 12 / --------- =

$(2xy^3)^3 = 2^3x^3(y^3)^3 = 8x^3y^9$

7. CHOICE A: $(2x – 1)(4x + 1) = 2x(4x + 1) + (- 1)(4x + 1)$

$= 8x^2 + 2x – 4x – 1$

$= 8x^2 - 2x – 1$

8. CHOICE A: 4" 10$^{\#15}$ / ———— #15+12 #3 #4

9. CHOICE D: A co[illegible]mon [illegible] nec[illegible]

$\frac{x^2}{1} + \frac{x}{y}$ multiply the first term by $\frac{y}{y}$ to get

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

10. CHOICE C: This is the difference between two squares.

$x^2 - 100 = (x - 10)(x + 10)$

11. CHOICE A: $(5 \times 10^{8})(6 \times 10^{-12}) = 30 \times 10^{8-12} = 30 \times 10^{-4} = 3 \times 10^{-3}$

12. CHOICE A: $(2x + 3) - (x - 2) = 2x + 3 - x + 2 = x + 5$

13. CHOICE C: $A^2 + B^2$ [illegible]

14. CHOICE C: Let x be the number. "Of" means multiply. "is" means equals.

$\frac{1}{3}(x) = 8$

Multiply both sides by three: $x = 24$

One fourth of 24 is

$\frac{1}{4}(24) = 6$

15. CHOICE A: $x^3 y = (-2)^3 5 = (-8)(5) = -40$

16. CHOICE D: 25 m = (25 m) (3 feet/m) = 75 feet.

17. CHOICE C: $(x^2 - 3x + 2) - (3x^2 - 5x - 1)$

$= x^2 - 3x + 2 - 3x^2 + 5x + 1$

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

18. CHOICE D: $\frac{2x}{3y} \cdot \frac{9y}{4x^2} = \frac{2x}{3y} \cdot \frac{9y}{4x^2} = \frac{3}{2x}$

29. CHOICE D: 10 (- 2) (- [redacted]

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5 5

30. CHOICE A: The graphs of $x - 2y = 6$ and $x + y = -3$ intersect at the value of
x and y that satisfy both equations. To get these, solve the two
equations [redacted]
6. Substitute into the second equation [redacted]

$(2y +$ [redacted]

$= 3y + 6 = -3$

Subtract 6 from both sides:

$3y + 6 = -3$
$\quad - 6 \quad - 6$

$3y = -9$

Divide both sides by three:

$3y = -9$ [redacted]
-- --
3 3

$y = -3$

31. CHOICE [redacted]
-- x 3 =
2 2

32. CHOICE B: $\sqrt[3]{-27} = -3$ because (-3)(-3)(-3) [redacted]
roots can be negative [redacted]

33. CHOICE A: As x becomes very large and positive, y becomes very large
because the term in x^2 increases much faster than that in x. The
same is true as x becomes very negative. Also recall an equation [redacted]
of the form $ax^2 + bx + c$ is a parabola.

34. CHOICE D: Recall that $\log_b(x) = n$ means $b^n = x$.

$\log_3(x + 1) = 2$ means...

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= 6w + 6 = 90
  - 6 - 6

6w = 84
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6 6

w = 14

56. CHOICE A: 4 (s + 2) = (4 x s) + (4 x 2) = 4s + 8

57. CHOICE A: $3/4 \text{"} 1/7 = \frac{3}{4} \text{"} \frac{1}{7} = \frac{21 \text{"} 4}{28} = \frac{17}{28}$

58. CHOICE B: Subtract one from both sides:

1 – 5x < 3
- 1 - 1

- 5x < 2

Divide both sides by -5, and remember to switch the sign of the inequality because we are dividing by a negative number:

- 5x < 2
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- 5 - 5

x > - 2 / 5

59. CHOICE B: The function has an absolute minimum at x = 1, the lowest point on the graph between 0 and 4. The other low point at x = 3 is a "local minimum.”

60. CHOICE A: $3^2 + 4^2 = D^2 = 25$ so D = 5.

61. CHOICE B: $\left(2\sqrt{3}\right)\left(3\sqrt{6}\right) = 6\sqrt{18} = 6\sqrt{(2)(9)} =$
$6\sqrt{9}\sqrt{2} = (6)(3)\sqrt{2} = 18\sqrt{2}$

62. CHOICE B: $1 – \sin^2\# = \cos^2\#$ (a trigonometric identity).

63. CHOICE A: f (x) = cos(3x), then f(! / 6) = cos(/ 2) = 0.

64. CHOICE A: The circumference of a circle is 2″R.

65. CHOICE E: The sine curve has a y-intercept at zero, increases as x increases to $/2 and decreases as x decreases to - $/2.

66. CHOICE E: csc# = 1/sin# and tan # = sin #/cos #, so
sin # tan # csc^2 # = sin # (sin #/cos #) (1/sin^2 #) = 1/cos # = sec #.

67. CHOICE B: tan # = sin #/cos #, and cos (- $/2) is zero. A zero in the denominator renders the expression undefined.

68. CHOICE E: The area of a circle is ″R^2

69. CHOICE B: the sum of the angles in a triangle add up to 180 degrees.

70. CHOICE C: Taking the slope between x = 0 and x = 5, we see that:

$$\text{slope} = \frac{\text{change in y}}{\text{change in x}} = \frac{20 - 5}{5 - 0} = \frac{15}{5} = 3$$

71. CHOICE E:

$$\left(\frac{100\,\text{km}}{\text{minute}}\right) = \left(\frac{100\,\text{km}}{\text{minute}}\right)\left(\frac{5\,\text{miles}}{8\,\text{km}}\right)\left(\frac{1\,\text{minute}}{60\,\text{seconds}}\right)$$

$$= \frac{500\,\text{miles}}{480\,\text{seconds}} = 1\,\frac{\text{mile}}{\text{second}}$$