

Answer Key

Section 7-1

1. C 2. A 3. B 4. B 5. C
6. 5000 7. 16

Section 7-2

1. 25 2. 1.5 3. 0.9 4. 75 5. 4800
6. B 7. D 8. D

Section 7-3

1. D 2. A 3. C 4. C 5. 80
6. 218

Chapter 7 Practice Test

1. D 2. C 3. C 4. B 5. D
6. C 7. D 8. A 9. C 10. 2.7
11. 684 12. 38.4

Answers and Explanations

Section 7-1

1. C

$$0.03\% \text{ of } 4 = 0.03 \times \frac{1}{100} \times 4 = 0.0012$$

2. A

$$\frac{1}{400} = \frac{1}{400} \times 100\% = \frac{1}{4}\% = 0.25\%$$

3. B

$$\begin{array}{ll} x - 0.2x & x \text{ is decreased by 20 percent.} \\ = 0.8x & \text{Simplify.} \\ y + 0.2y & y \text{ is increased by 20 percent.} \\ = 1.2y & \text{Simplify.} \end{array}$$

The product of decreased x and increased y is $0.8x \times 1.2y = 0.96xy$. So, the product is decreased by 4 percent.

4. B

Divide 4.5×10^5 by 9×10^4 .

$$\frac{4.5 \times 10^5}{9 \times 10^4} = 5$$

$$\text{So, } 4.5 \times 10^5 = (9 \times 10^4) \times 5 = 9 \times 10^4 + 4(9 \times 10^4)$$

$$= 9 \times 10^4 + 400\%(9 \times 10^4).$$

Therefore, 4.5×10^5 is 400% greater than 9×10^4 .

5. C

$$\begin{aligned} \text{Percent increase} &= \frac{\text{amount of increase}}{\text{original amount}} \\ &= \frac{72 - 60}{60} = \frac{12}{60} = \frac{1}{5} = 0.2 = 20\% \end{aligned}$$

6. 5000

Let x = last year's enrollment in Mesa School District.

$$\underbrace{6000}_{\text{this year's enrollment}} = \underbrace{x + 0.2x}_{20\% \text{ more than last year's enrollment}}$$

$$6000 = 1.2x$$

$$x = \frac{6000}{1.2} = 5000$$

7. 16

$$1.25x = 80 \quad 125\% \text{ of } x \text{ is } 80.$$

$$x = \frac{80}{1.25} = 64 \quad \text{Solve for } x.$$

$$x = n\% \times 400 \quad x \text{ is } n\% \text{ of } 400.$$

$$x = n \times \frac{1}{100} \times 400 \quad \text{Percent means } \frac{1}{100}.$$

$$x = n \times 4 \quad \text{Simplify.}$$

$$64 = n \times 4 \quad \text{Substitute } 64 \text{ for } x.$$

$$16 = n \quad \text{Divide each side by } 4.$$

Section 7-2

1. 25

$$\frac{28}{100} \times n = 7 \quad 28\% \text{ of a number is } 7.$$

$$n = 7 \times \frac{100}{28} \quad \text{Multiply each side by } \frac{100}{28}.$$

$$n = 25 \quad \text{Simplify.}$$

2. 1.5

$$3.6 = 2.4 \times n \quad 3.6 \text{ is } 240\% \text{ of a number.}$$

$$\frac{3.6}{2.4} = n \quad \text{Divide each side by } 2.4.$$

$$1.5 = n \quad \text{Simplify.}$$

3. 0.9

$$\frac{1}{2} \times \frac{1}{100} \times 180 = n \quad \frac{1}{2}\% \text{ is } \frac{1}{2} \times \frac{1}{100}.$$

$$\frac{180}{200} = n \quad \text{Simplify.}$$

$$0.9 = n \quad \text{Simplify.}$$

4. 75

$$3\frac{1}{3} \times \frac{1}{100} \times n = 2.5 \quad 3\frac{1}{3}\% \text{ is } 3\frac{1}{3} \times \frac{1}{100}.$$

$$\frac{10}{3} \times \frac{1}{100} \times n = 2.5 \quad \text{Simplify.}$$

$$\frac{1}{30}n = 2.5 \quad \text{Simplify.}$$

$$n = 2.5 \times 30 = 75 \quad \text{Multiply each side by 30.}$$

5. 4800

$$26.4 = 0.55 \times \frac{1}{100} \times n \quad 0.55\% \text{ is } 0.55 \times \frac{1}{100}.$$

$$26.4 = 0.0055n \quad \text{Simplify.}$$

$$\frac{26.4}{0.0055} = \frac{0.0055n}{0.0055} \quad \text{Divide each side by 0.0055.}$$

$$4800 = n \quad \text{Simplify.}$$

6. B

$$\frac{\underbrace{n}_{\text{what percent}}}{\underbrace{100}_{\text{of}}} \times 12 = 8$$

$$n = 8 \cdot \frac{100}{12} \Rightarrow n = 66\frac{2}{3}$$

8 is $66\frac{2}{3}\%$ of 12.

7. D

54 is 120% of k .

The above expression can be written as the equation $54 = 1.2 \times k$. Or it can be written as

$$\text{the proportion } \frac{120}{100} = \frac{54}{k}.$$

Choice D is correct.

8. D

Let x = Paul's monthly salary.

$$\frac{\underbrace{4500}_{\text{Kevin's monthly salary}}}{100} = \frac{\underbrace{0.72}_{\text{72 percent}}}{100} \times \frac{\underbrace{x}_{\text{Paul's monthly salary}}}{100}$$

$$4500 = 0.72x$$

$$x = \frac{4500}{0.72} = 6250$$

Section 7-3

1. D

There are n candies in a jar and one candy is removed. So, $n - 1$ candies are left in the jar.

The fraction of candies left in the jar is $\frac{n-1}{n}$.

Thus, the percent of candies left in the jar is $(\frac{n-1}{n})100\%$.

2. A

Let x = the original price of the cellphone. The discounted price is 25% off the original price, so $x - 0.25x$, or $0.75x$, is the discounted price. After an additional discount of 20% off the first discounted price, the new price is $0.75x - 0.2(0.75x)$, or $0.6x$, which is the final price of \$348. Therefore, $0.6x = 348$. Solving the equation for x yields $x = 580$.

3. C

Let x = the amount of 40% solution to be added. Let $50 - x$ = the amount of 30% solution to be added.

x liters of 40% acid + $(50 - x)$ liters of 30% acid = 50 liters of 36% acid

$$0.4x + 0.3(50 - x) = 0.36(50)$$

$$0.4x + 15 - 0.3x = 18$$

$$0.1x + 15 = 18$$

$$0.1x = 3$$

$$x = 30$$

30 liters of 40% acid solution should be added.

4. C

If s is the amount invested in savings and r is the amount invested in bonds, $s + r$ represents the total amount invested, which is equal to \$5,000. Therefore, $s + r = 5000$.

If the amount invested in savings pays 4.5% interest and the amount invested in bonds pays 8% interest, $0.045s + 0.08r$ represents the total income from investment, which is equal to \$305.50. Therefore, $0.045s + 0.08r = 305.50$.

Choice C is correct.

5. 80

Let x = the price of the backpack before adding profit and tax.

After 50% profit the price of the backpack will be $x + 0.5x$, or $1.5x$.

After 8% tax the price of the backpack will be $1.5x + .08(1.5x)$, or $1.62x$, which is equal to \$129.60. Therefore, $1.62x = 129.60$. Solving for x yields $x = 80$.

The price of the backpack before adding profit and tax was \$80.

6. 218

The number of male students = $800 \times 0.45 = 360$.

The number of female students = $800 - 360 = 440$.

30% of male students = $360 \times 0.3 = 108$.

25% of female students = $440 \times 0.25 = 110$.

The number of students who play varsity sports = $108 + 110 = 218$

Chapter 7 Practice Test

1. D

If x mL of a 34% acid solution is added to a 10% acid solution and the resulting solution is 40 mL of a 25% solution, then the amount of the 10% acid solution should be $40 - x$ mL.

x mL of 34% acid + $(40 - x)$ mL of 10% acid = 40 mL of 25% acid

$$0.34x + 0.1(40 - x) = 0.25(40)$$

$$0.34x + 4 - 0.1x = 10$$

$$0.24x = 6$$

$$x = 25$$

2. C

The cost of 3 packages of pens is $3 \times \$8.00$, or \$24 and the cost of 12 pens bought individually is $12 \times \$2.50$, or \$30. The amount saved is $30 - 24$ dollars, or \$6. The percent of savings he saved on 12 pens of the amount he paid is

$$\frac{6}{24} \cdot 100\%, \text{ or } 25\%.$$

3. C

The number of orange flavored drinks in the store = $600 \times 0.25 = 150$.

The number of orange flavored drinks sold on Monday = $150 \times 0.3 = 45$.

Remaining orange flavored drinks = $150 - 45 = 105$.

The number of orange flavored drinks sold on Tuesday is 20% of the remaining orange flavored drinks, which is 105×0.2 , or 21. Therefore, the number of bottles of orange flavored drinks sold in the two days is $45 + 21$, or 66.

4. B

After 15% discount, the price of the tablet is $x - 0.15x$, or $0.85x$. After an additional 12% discount, the price of the tablet is $0.85x - 0.12(0.85x)$, or $0.748x$.

5. D

n = total number of shoes m = the number of brown shoes. So the number of black shoes is $n - m$. The fraction of black shoes in the store

is $\frac{n - m}{n}$, so the percent of black shoes in the

store is $(\frac{n - m}{n}) \times 100\%$. This is equivalent to

$$(\frac{n}{n} - \frac{m}{n}) \times 100\%, \text{ or } (1 - \frac{m}{n}) \times 100\%.$$

6. C

If b is increased by 150%, it becomes $b + 1.5b$, or $2.5b$. If c is decreased by 60%, it becomes $c - 0.6c$, or $0.4c$. Multiplying these new values gives $a = 3.2(2.5b \times 0.4c) = 3.2(bc)$.

Therefore, the value is unchanged.

7. D

If 10 books are increased by x percent, then there will be $10 + 10 \times \frac{x}{100}$ books, which is equal to 24.

$$10 + 10 \times \frac{x}{100} = 24$$

$$\Rightarrow 10 \times \frac{x}{100} = 14 \Rightarrow \frac{x}{10} = 14$$

$$\Rightarrow x = 140$$

8. A

Number n is 25 less than 120 percent of itself.

$$n = 1.2n - 25$$

$$-0.2n = -25$$

$$n = \frac{-25}{-0.2} = 125$$

9. C

The number of blue cars = $500 \times 0.07 = 35$

The number of red cars = $500 \times 0.04 = 20$

Let 35 is n percent greater than 20.

$$\text{Then } 35 = 20 + 20 \cdot \frac{n}{100}.$$

$$35 - 20 = 20 + 20 \cdot \frac{n}{100} - 20$$

$$15 = \frac{1}{5}n$$

$$75 = n$$

The number of blue cars is 75% greater than the number of red cars.

10. 2.7

300% of 0.18 is equivalent to 20% of b .

$$3 \times 0.18 = 0.2b \quad 300\% = 3, \quad 20\% = 0.2$$

$$0.54 = 0.2b \quad \text{Simplify.}$$

$$\frac{0.54}{0.2} = \frac{0.2}{0.2}b \quad \text{Divide each side by } 0.2.$$

$$2.7 = b \quad \text{Simplify.}$$

11. 684

Total amount contributed by five people
= $\$9,000 \times 5 = \$45,000$.

The price of the sailboat after 8% tax
= $\$38,500 + 0.08 \times \$38,500 = \$41,580$.

The amount that should be refunded
= $\$45,000 - \$41,580 = \$3,420$.

Dividing \$3,420 by 5 yields \$684.

Thus \$684 should be refunded to each person.

12. 38.4

Let m = the wholesale cost of MP3.

The selling price of \$72 is 50% more than the wholesale cost.

$$72 = m + 0.5m$$

$$72 = 1.5m$$

$$48 = m$$

The special holiday sale of the MP3 was 20% less than the wholesale cost. Therefore,

The special price of MP3

$$= m - 0.2m$$

$$= 48 - 0.2 \times 48 \quad m = 48$$

$$= 38.4$$

The special sale price of the MP3 was \$38.4.