



**RECRUIT FIREFIGHTER
WRITTEN TEST STUDY GUIDE**

DOING YOUR BEST ON THE RECRUIT FIREFIGHTER WRITTEN TEST

WHAT IS THE TEST ABOUT?

Part 1 of the test measures mathematics such as addition, subtraction, multiplication, division, ratios, square roots, and the use of decimals, fractions, and percentages. Part 1 also measures reading comprehension. Part 2 measures job-related personal characteristics that have been demonstrated to be indicators of success as a firefighter.

CAN YOU STUDY FOR IT?

We strongly urge:

*When you read, concentrate on what you are reading. Try to understand its full meaning and implications.

*Read articles or books on practical subjects. Exactly what you read is not nearly as important as how well you use it to sharpen your reading skills. So choose a subject that interests you.

*After reading a paragraph or section, put it aside and test yourself on it.

*Review and practice mathematics computations and applications.

*Of course, you can't "study for" your personal characteristics. The best thing to do on this part of the test is to answer the questions honestly. Your experiences, attitudes, and interests have built up over a lifetime and would be difficult, if not impossible, to change. Any attempts to "fake" the right answer may not be correct. So, again, the best advice we can give you is to answer these questions honestly.

QUESTION FORMAT

Questions in the Firefighter written test may be either multiple-choice or true/false. This means that each question gives you a set of answers from which to choose. You are to choose the one answer that is the best one, the one most nearly or most often correct, or the one usually true for you. Here is an example. It makes a very important point, so pay special attention to it.

The number of days in a year is

- A. 365
- B. 366
- C. 367
- D. 368

The answer you should choose is choice A, because it is the one which is most often correct. Choice B is true for leap years, but most years have 365 days. Therefore, choice A is the best answer.

STRATEGIES FOR ANSWERING QUESTIONS

1. Read the entire question carefully. Be sure that you know what the question asks, and what the choices say. On every test, people choose wrong answers simply because they failed to read the question or answers carefully, or because they chose an answer before reading all answers.
2. Choose the answer that is GENERALLY best. Answer according to what is generally or usually true, not by what would be true in some particular case. Remember the question about the number of days in a year. The right answer was the one that was true for most years, not the one that was true for leap years. To keep the questions short, they cannot go into a lot of detail. Sometimes there is no answer that is complete, or exactly correct, or always correct. The best answer is the one that is right, under ordinary conditions.

For example, look at this question: In reading this information, it is most important that a person

- A. read it more than once
- B. understand what is read
- C. read slowly

Some people will read this information slowly, and some people may benefit from reading it more than once. However, what is most important is that a person understands what he or she reads. Therefore, choice B is the right answer.

3. Use your time efficiently. The Firefighter written test is not a speed test, but it does not give you unlimited time, either.

*Read at your normal speed. Don't slow down just because you are taking a test.

*Eliminate choices you know are wrong. When you have trouble deciding on the best answer but have decided one or two answers are definitely not best, avoid further consideration of those, and concentrate on the answers you think might be correct.

*Move right along so that you finish the test and have time to go back and do more work on the questions that need it. Numbers 4 and 5 (below) will give you a good plan for handling questions that are hard for you, helping you not to get bogged down elsewhere on the test.

4. Make decisions. When you first read a question, decide SOMETHING about it.

Your decision should be one of the following:

- a. You may decide you know the answer. You have little or no doubt about it. Mark your answer on the answer sheet. Spend no more time on that question.

b. You may decide that figuring out the answer is possible, but will take you a lot of time. Don't mark down an answer. Simply skip the question for now and come back to it later. (In answering the next question, make sure you are at the right place on your answer sheet).

c. You may decide you don't know the answer and that all you will ever be able to do is make a guess. Make the guess. Mark the answer sheet to show your guess. Don't waste any more time on that question. There is no penalty for guessing and sometimes you will guess correctly. If you can narrow down your guessing to the two or three most likely answers, you can increase your chance of guessing correctly.

5. Don't give up. Many people give up too easily on test questions. If the question looks hard, they don't even try. Here are some of the kinds of questions people give up on that they could answer if they just tried harder:

a. Mathematics questions may appear difficult because of the symbols or letters used, but remember, they all test for these basic operations: addition, subtraction, multiplication, division, ratios, squares and square roots, the use and conversion of decimals, fractions and percentages, and the use of algebraic formulas.

b. Questions testing your ability to read, understand and use what you have read. Sometimes people give up on a question because it looks technical, when all the information needed to answer it is right there in front of them! Sometimes the reading material looks long and complicated. Look for the main idea. Look for the specific information you need to answer the question. Make reasonable inferences.

c. The personal characteristics questions will be very difficult if you try to figure out the "right" answer, but they will be very easy if you simply answer honestly.

In a test like the one for Firefighter, some questions are easy and some are hard. Probably no one will make a perfect score. If it is hard for you to figure out an answer, it is probably hard for other people too. Keep your mind on the test and try!

6. Don't change answers too much. When people change answers, they more often change from a right answer to a wrong one, than from a wrong answer to a right one. The reason seems to be that people concentrate on a special case. This results in choosing the answer on the basis of facts that are not given in the question. Or people concentrate on one part of a question and forget about the rest of the question. Remember, the best answer is the one that is usually or generally right.

7. Be at your best the day of the test and be on time. Be well rested. Get a good night's sleep before the test. Allow plenty of time to get to the test site. Plan to get there early.

Reading Comprehension

Use the information below to answer questions 1, 2 and 3:

At 3:00 a.m., firefighters at House Number 9 were dispatched to respond to a fire involving two adjacent two-family homes numbered 136 A, 136 B, 137 A, and 137 B. When the firefighters arrived on the scene, both two-family homes were fully involved and some residents were standing outside. One of the residents, Mrs. Renner, came running up to Captain Keller, the commanding officer on the scene, to inform him about the status of the other residents. Mrs. Renner indicated that the occupants of 136 A, Mr. and Mrs. Spina and their daughter Helen, were on vacation. She was especially sure of this because the Spina's car was still gone. Mrs. Renner added that she, her husband and her son, Gary, had gotten out safely from 136 B. Mrs. Renner's son, Gary, informed the captain that he had gone around back to see if Mr. and Mrs. Simms, the elderly couple who lives alone in 137 A, had escaped through the back. Gary indicated that he could not see anyone and Mrs. Renner added that she hadn't seen the old couple either and was hoping they had already left town for their annual summer vacation. Finally, Mrs. Renner pointed to her neighbors from 137 B, Mr. and Mrs. Sloan, and indicated that they had gotten out safely and that they had no children in their home.

1. The following number of individuals normally reside in the homes on fire:

- A) 8
- B) 9
- C) 10
- D) 11

2. The address of the home that may still be occupied is:

- A) 136 A
- B) 136 B
- C) 137 A
- D) 137 B

3. The person who had gone around back to check for the elderly couple was:

- A) Mrs. Spina's daughter
- B) Mrs. Renner's son
- C) Mrs. Renner's husband
- D) Mr. Sloan

Use the information below to answer questions 4-6:

Hoselines

At the scene of a fire, crews attempting to perform a rescue should have every kind of protection available. The primary type of protective equipment is a hoseline with an adequate supply of water. The advantages of a fire stream are its effect in the control of fire in the rescue area and its cooling effect. The force of a water spray will also help ventilate the structure. This will help to provide cool fresh air, which will assist the victims as well as the rescue crew.

Another advantage of taking in a hoseline is that the hose automatically marks an escape route. If the conditions in the structure worsen, smoke may decrease most visibility. When this occurs, the hoseline will lead the rescue team out of the structure. Since searches for victims in the fire structure must be done quickly, the rescue crew may not be able to use hoselines in all cases. However, as the rescue continues, hoselines should be advanced to protect rescue workers and trapped victims. Fire streams may have to be used to knock down the fire and to protect victims.

At times it may be necessary to delay rescue in an area until a charged hoseline is ready to advance. The rescue crew must then enter the structure behind the protection of the fire stream. As the fire is controlled, the rescue crew can search each room.

To speed up the search of the more distant rooms, the rescue crew can leave the protection of the charged hoseline. Before this occurs, the rescue crew must tell the firefighter on the charged line of their actions.

Firefighters on the fire floor must keep in mind the presence of other rescue crews on the floors above the fire. If it appears that the fire streams will be unable to hold the fire, instant warning must be given to the crews above the fire. Steps should be taken to provide escape by ladder. An effort should also be made to place fire streams between the fire and the exposed rescue crews.

Caution must be exercised when stretching hoselines to keep them from blocking any rescue attempts. The one exception to this would be where the fire stream is required to protect the occupants' escape. When many persons have to get out of a building, rescue plans must be considered in the placement of equipment. This includes the stretching of hoselines.

While hoselines are designed as an extinguishment device, it is clear they are very effective in the rescue process. Firefighters must use the hoselines to assist them in all rescue operations for their safety and the safety of the trapped victims.

4. Firefighters must exercise extreme caution when stretching hoselines to keep them from blocking any rescue attempts. The one exception to this would be:

- A) when a fire stream is used to cover a nearby exposure
- B) the fire floor is fully engulfed in flames
- C) when a fire stream is required to protect occupants' escape
- D) when salvage operations have begun

5. You are on Engine 17 and have taken a hoseline into the second story of a three-story building. Engine 22 has proceeded to the third floor and is attacking the fire that is spreading upward. While fighting the fire on the second floor, you realize that extinguishment operations are going to be difficult if not impossible and it appears that the fire is stretching above to the third floor. Which of the following would be the correct procedure?

- A) order additional help into the second floor area to alleviate the situation
- B) give a warning to the members of Engine 22 above you that the fire has spread into the third floor area
- C) withdraw your crew members immediately and escape by ladder
- D) limit the amount of rescue and ventilation operations

6. According to the passage:

- A) Crews attempting to perform rescue should have every type of protection available. The primary type of protective equipment is an operating air mask.
- B) During rescue operations, firefighters for their own safety and that of trapped victims can call on the assistance of hoselines to provide them with direction.
- C) An uncharged hoseline with a water spray will help ventilate a structure allowing for additional assistance in rescuing the victims.
- D) decrease the amount of hoseline stretched into the area while increasing horizontal ventilation

Use the information below to answer questions 7-10:

In investigating an explosion it must first be determined whether a diffuse or a concentrated explosion has occurred. Diffuse explosions occur as a result of the ignition of natural gas, vapor from volatile liquids, or dust in an enclosed area. Thus, many diffuse explosions occur accidentally. In most cases, a diffuse explosion will create no crater or discoloration. It may or may not be followed by a fire, depending on the conditions at the time of ignition. In a diffuse explosion, the nature of the exploding material may often be determined by examination of the structure. If the explosion was caused by vapors which are lighter than air, such as natural gas, the explosion will tend to push out the walls of the structure near the top causing the ceiling to collapse. An explosion of vapors which are heavier than air, such as gasoline or kerosene, will tend to push out the walls near the bottom.

In a concentrated explosion there is a secondary force following the explosion, known as return force, or implosion. Frequently the explosion merely weakens the structure and the implosion causes it to collapse. High order concentrated explosions result from dynamite, TNT, and similar materials. This type of explosion is distinguished by local shattering and the presence of a crater. When craters are found, all crater materials should be collected, sealed and forwarded to the laboratory for examination. In low order concentrated explosions from such materials as black powder, an investigator should be able to find some unburned explosive that was blown outward from the center of the blast. Fragments of the container or the ignition device may also be found embedded in objects along the leading edge of the explosive force. In investigating all explosions, it is important to provide a careful sketch and photographs of the entire area; and to preserve all evidence from deterioration, change or modification.

7. Which of the following explosions is most likely to be accidental?

- A) an explosion where the base of the walls of a structure is blown outward
- B) an explosion in which there is considerable shattering of objects
- C) when there is considerable structural evidence of implosion effects
- D) when a crater area of special damage is found

8. An explosion in a small warehouse resulted in the ceiling's collapsing. If no crater is observed, which of the following would be the most probably cause of the explosion?

- A) arson caused by gasoline spread evenly on walls and floor
- B) a leak in the gas main to the heating system
- C) a homemade bomb constructed of lead pipe and black powder
- D) several sticks of dynamite or plastic explosive placed in the center of the room
- E) spontaneous combustion from kerosene soaked rags in a metal container

9. After an explosion in the living room of a residential home, a couch and the floor beneath it are found to be severely damaged. While the windows are blown out and one of the walls slightly caved in, most of the furniture in the room is only moderately damaged. These circumstances suggest that the damage was caused by:

- A) a high order concentrated explosion from some material such as dynamite
- B) a diffuse explosion resulting from the ignition of a volatile liquid
- C) a low order concentrated explosion, probably from a homemade bomb
- D) a gas leak in the basement
- E) gasoline on the couch

10. Which one of the following statements is implied by the passage?

- A) diffuse explosions are less likely to result in a fire than concentrated explosions
- B) the results of an implosion are more likely to be visible on the structure than the primary force of a concentrated explosion
- C) crater material is likely to be the most valuable evidence in a low order concentrated explosion
- D) explosions involving high degrees of local shattering are not likely to produce much evidence concerning the explosive device used

Answer key for reading comprehension:

- 1. C 6. B
- 2. C 7. A
- 3. B 8. B
- 4. C 9. C
- 5. B 10. C

Speed, Time, and Distance Worksheet

- 1 a. Mike rides his motorcycle with a constant speed of 54 miles per hour. How long will he take to travel a distance of 223.2 miles?
- 1 b. An airplane flies 177.3 miles with a constant speed of 760 mph and another 2763 miles with a constant speed of 540 mph. How much time in total does it take to travel these distances?
- 1 c. Noah's airplane trip took 1 hour 48 minutes. For one-half of that time, the airplane flew at a speed of 700 miles per hour, and for the rest of the time, it flew at a speed of 680 miles per hour. What distance did Noah travel?
- 2 a. Caleb rides his bike 56.9 miles with a constant speed of 14 mph and another 7.4 miles with a constant speed of 12 mph. What is his average speed for the total trip?
- 2 b. An airplane flies for 2 hours 52 minutes with a constant speed of 620 mph and then for another 3 hours 35 minutes with a constant speed of 520 mph. What distance did it go?
- 2 c. A police car drives 70.4 miles with a constant speed of 66 mph and another 100.9 miles with a constant speed of 68 mph. What is its average speed for the total trip?
- 3 a. Cindy rides her horse with a constant speed of 6 miles per hour. How long will she take to travel a distance of 13.2 miles?
- 3 b. A taxi hurries 292.6 miles with a constant speed of 77 mph and another 15.8 miles with a constant speed of 25 mph. How much time in total does it take to travel these distances?
- 3 c. An airplane flies for 1 hour 6 minutes with a constant speed of 640 mph and then for another 54 minutes with a constant speed of 660 mph. What distance did it go?
- 4 a. An airplane flies 2331 miles with a constant speed of 740 mph and another 792 miles with a constant speed of 540 mph. What is its average speed for the total trip?
- 4 b. Bob rides his horse 49.2 miles with a constant speed of 13 mph and another 25.7 miles with a constant speed of 7 mph. What is his average speed for the total trip?
- 4 c. A train travels with a constant speed of 79 miles per hour. How long will it take to travel a distance of 362.1 miles?
- 5 a. A minibus drives 88.3 miles with a constant speed of 25 mph and another 407.1 miles with a constant speed of 69 mph. What is its average speed for the total trip?
- 5 b. An airplane flies 2117 miles with a constant speed of 580 mph and another 4127.3 miles with a constant speed of 820 mph. How much time in total does it take to travel these distances?
- 5 c. Cindy's airplane trip took 2 hours 48 minutes. For one-third of that time, the airplane flew at a speed of 760 miles per hour, and for the rest of the time, it flew at a speed of 760 miles per hour. What

distance did Cindy travel?

6 a. Mike roller skates for 1 hour 35 minutes with a constant speed of 7 mph and then for another 2 hours 23 minutes with a constant speed of 9 mph. What is his average speed for the total trip?

6 b. A taxi hurries for 2 hours 42 minutes with a constant speed of 26 mph and then for another 1 hour 43 minutes with a constant speed of 40 mph. What distance did it go?

6 c. John's airplane trip took 5 hours 12 minutes. For one-fourth of that time, the airplane flew at a speed of 820 miles per hour, and for the rest of the time, it flew at a speed of 500 miles per hour. What distance did John travel?

Answer Key

1 a. He takes 4 hours 8 minutes or 4s to travel a distance of 223.2 miles.

1 b. It takes 5 hours and 21 minutes to travel the two distances.

1 c. Noah traveled 1242 miles.

2 a. His average speed is 13.7 mph.

2 b. It traveled a distance of 3640.6 miles.

2 c. Its average speed is 67.2 mph.

3 a. She takes 2 hours 12 minutes or 2s to travel a distance of 13.2 miles.

3 b. It takes 4 hours and 26 minutes to travel the two distances.

3 c. It traveled a distance of 1298 miles.

4 a. Its average speed is 676.5 mph.

4 b. His average speed is 10.1 mph.

4 c. It takes 4 hours 35 minutes or $4\frac{7}{12}$ hours to travel a distance of 362.1 miles.

5 a. Its average speed is 52.5 mph.

5 b. It takes 8 hours and 41 minutes to travel the two distances.

5 c. Cindy traveled 2128 miles.

6 a. His average speed is 8.2 mph.

6 b. It traveled a distance of 138.9 miles.

6 c. John traveled 3016 miles.

Square Roots Worksheet 1

Solve.

1 a. $\sqrt{16}$

1 b. $\sqrt{49}$

2 a. $\sqrt{36}$

2 b. $\sqrt{25}$

3 a. $\sqrt{0}$

3 b. $\sqrt{64}$

4 a. $\sqrt{196}$

4 b. $\sqrt{256}$

5 a. $\sqrt{225}$

5 b. $\sqrt{289}$

6 a. $\sqrt{9}$

6 b. $\sqrt{81}$

7 a. $\sqrt{4}$

7 b. $\sqrt{169}$

8 a. $\sqrt{121}$

8 b. $\sqrt{144}$

Page 2

Answer Key

1 a. 4

1 b. 7

2 a. 6

2 b. 5

3 a. 0

3 b. 8

4 a. 14

4 b. 16

5 a. 15

5 b. 17

6 a. 3

6 b. 9

7 a. 2

7 b. 13

8 a. 11

8 b. 12

Square Roots Worksheet 2

Solve.

1 a.
 $\sqrt{64} + \sqrt{16}$

4 b.
 $\sqrt{25} - \sqrt{25}$

1 b.
 $\sqrt{49} - \sqrt{36}$

5 a.
 $\sqrt{46} + 35$

2 a.
 $\sqrt{100} + \sqrt{144}$

5 b.
 $\sqrt{144} - \sqrt{64}$

2 b.
 $\sqrt{4} + \sqrt{49}$

6 a.
 $\sqrt{4} + 5$

3 a.
 $\sqrt{100} - \sqrt{36}$

6 b.
 $\sqrt{16} - \sqrt{4}$

3 b.
 $\sqrt{36} - \sqrt{144}$

7 a.
 $\sqrt{100} + \sqrt{64}$

4 a.
 $\sqrt{202} - 138$

7 b.
 $\sqrt{19} + 125$

Answer Key

1 a. 12
1 b. 1
2 a. 22
2 b. 9
3 a. 4
3 b. -6
4 a. 123.79

4 b. 0
5 a. 41.78
5 b. 4
6 a. 7
6 b. 2
7 a. 18
7 b. 129.36

Percentage Worksheet

- 1 a. What number is 3.4% of 39?
1 b. Find a number so that 46.2% of it is 91.
2 a. Find 97% of the number 81.
2 b. What number is 86.1% of 111?
3 a. What number is 87.9% of 2?
3 b. 109 is what percentage of 111?
4 a. Find what percentage of 32 is 13.
4 b. Find a number so that 47.7% of it is 44.
5 a. Find what percentage of 133 is 79.
5 b. 70 is what percentage of 123?
6 a. 0.5% of a certain number is 150.
What is the number?
6 b. What is 36.6% of 24?
7 a. What is 55.8% of 110?
7 b. What is 9.1% of 141?
8 a. Find 61.2% of the number 39.
8 b. What percentage of 98 is 81?
- 9 a. Find a number so that 36.5% of it is 14.
9 b. What percentage of 79 is 56?
10 a. How many percent of 143 is 47?
10 b. How many percent of 90 is 1?
11 a. What percentage of 133 is 68?
11 b. What number is 14.8% of 34?
12 a. Find 41.1% of the number 123.
12 b. 36.9% of a certain number is 29. What is the number?
13 a. Find what percentage of 113 is 15.
13 b. Find 95.3% of the number 38.
14 a. What is 86.9% of 61?
14 b. What is 15.5% of 65?
15 a. Find what percentage of 86 is 16.
15 b. 73.4% of a certain number is 54. What is the number?

Answer Key

- 1 a. 3.4% of 39 is 1.326
1 b. 46.2% of 196.97 is 91
2 a. 97% of 81 is 78.57
2 b. 86.1% of 111 is 95.571
3 a. 87.9% of 2 is 1.758
3 b. 109 is 98.198% of 111
4 a. 13 is 40.625% of 32
4 b. 47.7% of 92.243 is 44
5 a. 79 is 59.398% of 133
5 b. 70 is 56.911% of 123
6 a. 0.5% of 30000 is 150
6 b. 36.6% of 24 is 8.784
7 a. 55.8% of 110 is 61.38
7 b. 9.1% of 141 is 12.831
8 a. 61.2% of 39 is 23.868
8 b. 81 is 82.653% of 98
9 a. 36.5% of 38.356 is 14
9 b. 56 is 70.886% of 79
10 a. 47 is 32.867% of 143
10 b. 1 is 1.111% of 90
11 a. 68 is 51.128% of 133
11 b. 14.8% of 34 is 5.032
12 a. 41.1% of 123 is 50.553
12 b. 36.9% of 78.591 is 29
13 a. 15 is 13.274% of 113
13 b. 95.3% of 38 is 36.214
14 a. 86.9% of 61 is 53.009
14 b. 15.5% of 65 is 10.075
15 a. 16 is 18.605% of 86
15 b. 73.4% of 73.569 is 54

Adding and Subtracting Time

You can add and subtract time. Remember that there are 60 minutes (min) in 1 hour (h).

$$\begin{array}{r} 6 \text{ h } 32 \text{ min} \\ + 2 \text{ h } 43 \text{ min} \\ \hline 8 \text{ h } 75 \text{ min} = \mathbf{9 \text{ h } 15 \text{ min}} \end{array}$$

$$\begin{array}{r} 7 \text{ h } 16 \text{ min} = 6 \text{ h } + 60 \text{ min} + 16 \text{ min} = 6 \text{ h } 76 \text{ min} \\ - 4 \text{ h } 28 \text{ min} \\ \hline 2 \text{ h } 48 \text{ min} \end{array}$$

Add or subtract. Then solve each problem.

1.
$$\begin{array}{r} 10 \text{ h } 20 \text{ min} \\ - 7 \text{ h } 47 \text{ min} \\ \hline \end{array}$$

2.
$$\begin{array}{r} 5 \text{ h } 45 \text{ min} \\ - 4 \text{ h } 34 \text{ min} \\ \hline \end{array}$$

3.
$$\begin{array}{r} 9 \text{ h } 27 \text{ min} \\ - 5 \text{ h } 54 \text{ min} \\ \hline \end{array}$$

4. A plane left an airport at 1:23 P.M. It arrived at its destination in the same time zone at 4:10 P.M. How long was the flight?

5. Mr. Larson put a roast in the oven at 2:45 P.M. He cooked the roast for 3 hours 48 minutes. What time did Mr. Larson take the roast out of the oven?

6. Gabriel watched 3 old movies on videotape. The first movie was 62 minutes long. The second was 1 hour 34 minutes long. The third was 1 hour 25 minutes long. He started watching at 3:15 P.M. At what time did the last movie end?

Answer Key

1. 2 h 33 min
2. 10 h 19 min
3. 3 h 33 min
4. 2 h 47 min
5. 6:33 p.m.
6. 7:16 p.m.

Ratio Problems Worksheet

Solve. If the problem asks for a ratio, give it in simplified form.

- 1 a. A kennel has 50 dogs in total, some are puppies and some are adult dogs. The ratio of puppies to adult dogs in a kennel is 1 : 4. How many adult dogs are there?
- 1 b. Isabella and Jayden share a reward of \$99 in a ratio of 4 : 5. What fraction of the total reward does Jayden get?
- 2 a. In a cookie mix, we find spice cookies, pinwheel cookies, and almond cookies in a ratio of 2 : 1 : 3. If a bag of the mix contains 8 pinwheel cookies, how many cookies in total are there?
- 2 b. A bag contains 126 marbles, some blue and some green. The ratio of blue marbles to green ones is 3 : 4. How many blue marbles are there?
- 3 a. A bag contains 126 marbles, some white and some red. The ratio of white marbles to red ones is 3 : 4. How many white marbles are there?
- 3 b. Elizabeth has nickels, dimes, and quarters in the ratio of 3 : 4 : 1. If 20 of Elizabeth's coins are quarters, how many nickels and dimes does Elizabeth have?
- 4 a. A jar contains 420 beans. Of them, 60 are lima beans and the rest are kidney beans. What is the ratio of lima beans to all the beans?
- 4 b. Isabella and Madison share a reward of \$72 in a ratio of 3 : 3. How much does Isabella get?
- 5 a. A kennel has 40 dogs in total, some are puppies and some are adult dogs. The ratio of puppies to adult dogs in a kennel is 2 : 3. How many adult dogs are there?
- 5 b. A bag contains 80 marbles, some white and some red. The ratio of white marbles to red ones is 3 : 2. How many red marbles are there?
- 6 a. Caden and Ava share a reward of \$120 in a ratio of 3 : 5. How much does Caden get?
- 6 b. Elizabeth has nickels, dimes, and quarters in the ratio of 1 : 5 : 4. If 44 of Elizabeth's coins are quarters, how many nickels and dimes does Elizabeth have?
- 7 a. A jar contains 910 beans. Of them, 260 are pinto beans and the rest are black beans. What is the ratio of pinto beans to all the beans?
- 7 b. Nathan has 143 coins. Of the coins, $\frac{1}{11}$ are nickels, $\frac{2}{11}$ are dimes, and the rest are quarters. What is the ratio of Nathan's nickels to dimes to quarters?
- 8 a. A jar contains 810 beans. Of all the beans, $\frac{2}{9}$ are cranberry beans and the rest are lima beans. What is the ratio of cranberry beans to lima beans?

8 b. In a cookie mix, we find cinnamon cookies, snickerdoodle cookies, and vanilla cookies in a ratio of 2 : 2 : 8. If a bag of the mix contains 36 snickerdoodle cookies, how many cookies in total are there?

Answer Key

- 1 a. There are 40 adult dogs.
- 1 b. Jayden gets $\frac{5}{9}$ of the total.
- 2 a. There are a total of 48 cookies.
- 2 b. There are 54 blue marbles.
- 3 a. There are 54 white marbles.
- 3 b. Elizabeth has 60 nickels and 80 dimes.
- 4 a. The ratio of lima beans to all beans is 1 : 7.
- 4 b. Isabella gets \$36.
- 5 a. There are 24 adult dogs.
- 5 b. There are 32 red marbles.
- 6 a. Caden gets \$45.
- 6 b. Elizabeth has 11 nickels and 55 dimes.
- 7 a. The ratio of pinto beans to all beans is 2 : 7.
- 7 b. The ratio is 1 : 2 : 8.
- 8 a. The ratio of cranberry beans to lima beans is 2 : 7.
- 8 b. There are a total of 216 cookies.