Below is a FREE 50-question practice examination that will help you in preparing for your entry-level firefighter examination. An answer key can be found at the end of the questions; a step-by-step instructional for the math problems is also included to help you determine how the answers were obtained.

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

Information Ordering

Lt. Banks is giving a lecture on the proper procedure when cutting a hole in a roof to provide adequate ventilation. He would like to include the statements listed below in his lecture. These statements have not been listed in the correct order.

1)   The hole should be located between the joists or rafters. Thus the joists or rafters should never be cut, as they are the main support for the roof.
2)   Locate the joists by sounding with the axe and noting the area that is solid. A solid sound will denote the location of the joist.
3)   Upon identifying wood sheathing, the firefighter may begin cutting with the fire axe. The axe should not be swung as a wood cutter would use it, but with short quick strokes.
4)   Once the joists are located, an adequate size hole at least 4 feet should be marked on the roof with the pick head. The roof covering tar paper should be removed before proceeding with the cutting procedure.

11.   The above procedure should be performed in which of the following order?

A)   1, 2, 3, 4   B)   2, 1, 3, 4
C)   1, 2, 4, 3   D)   2, 1, 4, 3

Lieutenant Pender made the following comments when discussing bends, knots, and hitches in rope:

1)   The bends that a rope undergoes in the formation of a knot or hitch are of three kinds: the bight, loop, and round turn.
2)   Knots and hitches are formed by combining these elements in different ways so that the tight part of the rope bears on the free end to hold it in place.
3)   The bight is formed by simply bending the rope, keeping the sides parallel; the loop is made by crossing the sides of a bight; the round turn consists of the further bending of one side of a loop.
4)   Knots weaken a rope because the rope is bent in order to form the knot and the outside fibers take most of the strain at the bend.
5)   The knot that weakens the rope the least is one requiring the least abrupt bending.

12.   Lieutenant Pender's discussion would be most effective if the above comments were presented in the following order?

A)   1, 2, 3, 5, 4   B)   5, 4, 2, 1, 3
C)   3, 1, 4, 5, 2   D)   4, 5, 1, 3, 2

Lieutenant Arthurs has prepared the following comments to stress the increased importance of respiratory protection to firefighters:

1.   Such is not the case in our technological world of today.
2.   When homes were built of wood and contained furnishings of ordinary combustibles they produced fewer toxic products of combustion.
3.   It has been well documented that most fire deaths occur from inhalation of smoke and toxic gases, rather than actual contact with fire.
4.   The need for respiratory protection in the fire service has increased greatly over the years.
5.   These gases, though still unhealthy, were not lethal in small quantities.
6.   Plastics, synthetic materials, pesticides, and other hazardous products can be found everywhere.

13.   The above comments could be made most effectively if they were presented in the following order.

A)   3, 6, 1, 2, 5, 4   B)   2, 5, 6, 1, 4, 3
C)   4, 2, 5, 1, 6, 3   D)   6, 3, 1, 4, 2, 5

During the night tour at Engine Company 500, eleven (11) alarms were received between the hours of 6 p.m. and 9 a.m. The types of alarms and times of occurrences were as follows:

Alarm #1	6:03 p.m.	illegally opened hydrant
Alarm #2	6:41 p.m.	false alarm
Alarm #3	7:00 p.m.	car fire in an abandoned car
Alarm #4	7:25 p.m.	garbage can fire
Alarm #5	8:30 p.m.	false alarm
Alarm #6	12:18 a.m.	fire in a wood frame house
Alarm #7	1:09 a.m.	fire in a brownstone apartment
Alarm #8	2:45 a.m.	basement fire in a hospital
Alarm #9	5:02 a.m.	sprinkler malfunction in an all-night deli
Alarm #10	7:53 a.m.	false alarm
Alarm #11	8:29 a.m.	food on the stove fire

14.   Based on the list of alarms, which one of the following statements is correct?

A)   False alarms occur most frequently in the early morning
B)   Fires involving victims are most likely to occur in the early evening
C)   Severe fires are most likely to occur in the early morning
D)   Non-fire related alarms occur more frequently in the evening

Listed below are emergency steps for buildings filled with gas but not involved in fire. These steps are to be followed in this exact order.

1.   Have dispatcher notify proper gas emergency crew.
2.   Park fire vehicle well away from building; lay a line to handle fire following possible explosion.
3.   Shut off gas outside at meter or curb valve.
4.   Open windows and doors from outside to obtain ventilation.
5.   Evacuate any endangered occupants.
6.   Do not operate any electric switches inside the gas-involved area.
7.   Use combustible gas indicators to determine when entry is safe.
8.   Wear self-contained masks to trace source of escaping gas and shut off or plug (but do NOT then turn on gas to building - leave restoration of service to gas company employees.)

15.   Firefighters have arrived on the scene of a building filled with natural gas. It has been reported by the occupants of the building that there is no fire. Firefighters have shut off the gas outside at meter or curb valve. They should next:

A)   evacuate any endangered occupants
B)   have dispatcher notify proper gas emergency crew
C)   open windows and doors from outside to obtain ventilation
D)   use combustible gas indicators to determine when entry is safe

16.   Engine Company 29 has arrived on the scene of Southwest Elementary School. They have been informed that there is a gas leak within the building, but no report of fire. Firefighters have parked away from the building and laid a hand line for safety considerations. They have shut off the gas at the outside meter and have opened windows and doors from outside to obtain ventilation. All endangered occupants have been evacuated. Firefighters have also turned on electrical lights in the hallway to assist in the evacuation process. They then used combustible gas indicators to determine when re-entry is safe.

Which of the following listed below is correct concerning the gas emergency at the elementary school:

A)   firefighters operated according to specified guidelines
B)   firefighters did not open doors from outside to obtain ventilation
C)   firefighters operated an electrical switch within the building
D)   firefighters did not lay the proper amount of hose line as safety precautions require

<u>Judgment, Human Relations, And Problem Solving</u>

17.   **To maintain an enthusiastic attitude toward your required duties and your fellow firefighters, you should do which of the following?**

A)   totally immerse yourself in your job at all times
B)   try to maintain an equal balance between your job as a firefighter and your home life
C)   your job should be your first responsibility and your home life following as a close second
D)   maintain a positive attitude toward your fellow firefighters and treat them as you would your family

18.   **Engine 17, Engine 22 and Squad 3 arrive at the scene of a one and one-half story dwelling located on a cul-de-sac in which fire is coming from the first floor. A neighbor approaches the officer and two firefighters concerning pertinent details about the fire. Which of the following would be the first question for the officer to ask the neighbor?**

A)   Where do you live and what is your address?
B)   Is there anybody presently in the house?
C)   Did you see anybody running from the house or do you know how the fire started?
D)   How long have the occupants lived at this address?

19.   **Your officer has just received information from the Battalion Chief that a complete apparatus inventory will be needed within one hour. Normally, this procedure would take 1-1/2 to 2 hours. Which of the following would be the best way for you to accomplish this task on time?**

A)   immediately start the apparatus inventory since there is little time to complete it
B)   ask others to assist you in the job so that you retain a coordinator's role in the task with little or no work involved on your part
C)   first look over the inventory, organize it, and see what will be needed to accomplish the task within the given time frame
D)   tell the officer it will be impossible for you to complete this task within the time frame presented to you

20.   **You have just reported for your shift at a fire station and are stowing your gear in your locker when you hear something in the bathroom. You enter the bathroom and call out, but there is no response. You proceed into the bathroom and observe Firefighter B slumped over the sink. There is a strong smell of alcohol. What should you do?**

A)   ignore Firefighter B and forget the whole thing
B)   immediately take Firefighter B home without telling anyone
C)   summon an officer
D)   ask Firefighter B if he is all right, how much he had to drink, and how long ago

21. A fracture is a broken bone. In a simple fracture, the skin is not broken. In a compound fracture, a broken end of the bone pierces the skin. Whenever a fracture is feared, the first thing to do is to prevent motion of the broken part. Suppose that a firefighter has just tripped on a stairway in the firehouse and twisted his ankle. He says it hurts badly, but you cannot tell what is wrong merely by looking at it. Of the following, the best action to take is to

A) tell the firefighter to stand up and see whether he can walk
B) move the ankle gently to see whether you can feel any broken ends of the bone
C) tell the firefighter to rest a few minutes and promise to return later to see whether his condition has improved
D) tell the firefighter not to move his foot, and put in a call for medical assistance

22. Firefighters from Engine 24 and Ladder 20 have arrived on the scene of a multiple suite dwelling. Firefighters have been instructed by the battalion chief to initiate procedures for delaying spread of fire from one occupancy to the next. Which of the following is the best procedure to accomplish this task?

A) the doors between rooms should be closed as soon as possible to decrease the spread of fire
B) order hoselines into the occupancies on either side of the fire to limit the spread of fire
C) immediately open all windows within the occupancy to limit the spread of fire
D) stand by in a ready position, inasmuch as most occupancies have fire spread limitation controls to decrease the chance of ignition

23. Firefighters have just arrived on the scene of a three-car accident on Highway I-90. Which of the following would be the first action taken by firefighters?

A) check for any injuries to the occupants of cars involved in the accident
B) immediately call for three or more apparatus to block the flow of traffic so firefighters will not be endangered
C) stand by and direct traffic at the scene of the accident until police and ambulances arrive to treat the injured occupants
D) immediately contact the alarm office to inform the police department of the accident and ask for their immediate response to the scene

24. During overhaul procedures, firefighters often come across valuable items (including money and jewelry). You are overhauling a bedroom and notice one of your fellow firefighters taking what appears to be an expensive piece of jewelry and putting it in his pocket. Which of the following would be the most correct action to take?

A) immediately go to your supervisor and inform him of what your coworker has done, without first asking for an explanation by the coworker
B) ask your fellow firefighter to explain his actions
C) immediately tell the firefighter that what he has done is dishonest and goes against all professional and ethical firefighter standards
D) don't say anything to the firefighter unless you are approached by the firefighter concerning the incident

Inductive Reasoning

The data in this table relate to the inspection of a twelve-story office building. On certain floors the landlord (L) is responsible for fire safety; on other floors the Tenants (T) have assumed responsibility for fire safety in their rented areas. The table gives the number of violations found on the first inspection visit, the total number of safety requirements on each floor, and the number of violations still found on a follow-up inspection visit three days later.

Floor	Landlord or Tenant	# of Violations 1st Visit	# of Safety Requirements	# of Violations 2nd Visit
Basement	L	2	6	0
1	L	5	24	3
2	L	6	18	2
3	T	4	12	2
4	L	2	12	0
5	T	4	15	1
6	T	5	14	0
7	T	3	16	3
8	L	4	12	1
9	L	2	12	1
10	T	2	6	1
11	T	2	6	1
12	L	3	12	1

25.   **Based on the data in the above table, it would be most correct to conclude that in this building:**

A)   tenants have more violations than the landlord
B)   part from the basement, tenants have more violations than the landlord
C)   the landlord has more violations than the tenants if one considers only the floors above the first floor
D)   the landlord has more violations than the tenants

26.   **Based on the data in the above table, it would be most correct to conclude that, taking into account the number of safety requirements on each floor, in this building:**

A)   the landlord is more effective than the tenants in meeting the safety requirements
B)   the tenants are more effective than the landlord in meeting the safety requirements
C)   the landlord is more effective on the first six floors, and the tenants are more effective on the top six floors in meeting the safety requirements
D)   the landlord is more effective in meeting the safety requirements on the top six floors

Listed below is a series of reports from several people who witnessed an early evening fire at the Spruce Street subway station. The description of each suspect is as follows:

Report No. 1 (November 16): Male, white, early 30s, 5'10", 180 pounds, dark hair, moustache, one gold earring, blue jeans, black jacket, running shoes.
Report No. 2 (November 20): Male, white, 25-30, 5'6", 120 pounds, dark hair, dark glasses, one gold earring, blue jeans, green sweat shirt, running shoes.
Report No. 3 (November 21): Male, white, 40-45, 5'10", 130-140 pounds, dark hair, moustache, one gold earring, blue jeans, black jacket, running shoes.

On November 23rd, another fire was started by a male who was loitering near the subway station exit. However, a witness called 911 and the male was apprehended two blocks away. The description of the suspect is as follows:

Report No. 4 (November 23): Male, white, 25-30, 5'6", 175 pounds, dark hair, moustache, blue jeans, black jacket, green ski cap, boots.

27. **Based on the description of the suspects in the first three fire reports, the suspect in Report No. 4 should also be considered a suspect in:**

A)   Report No. 1, but not in Report Nos. 2 or 3
B)   Report Nos. 1 and 2, but not in Report No. 3
C)   Report Nos. 2 and 3, but not in Report No. 1
D)   Report Nos. 1, 2 and 3

Listed below is the standard color and label codes used by industries that work with chemicals to help specify the type of materials or chemicals inside a container.

COLOR/LABEL CODE | MATERIAL/CHEMICAL DESCRIPTION

White   (Poison A)   Example: Hydrogen Cyanide and Nitrogen Dioxide.   An extremely toxic hazard which may be in solid, gas or liquid form.

Orange (Explosive C)   Example: Fireworks and small arms ammunition.   Pyrolectmics. Usually small containers of explosive material.

Orange   Example: TNT and Dynamite.   High explosives.

Red/White/Blue (-W-)   Examples: Sodium, Calcium and Carbide.   Water reactive flammable solid.

Orange (Explosive B)   Example: Gunpowder.   Low explosives.   Products that are ignite easily and burn quickly.

28. **At the scene of an over-turned semi-tractor trailer, the following materials were identified.   One container of Sodium, two cases of gunpowder, two drums of Carbide, two cylinders of Hydrogen Cyanide, two cylinders of Nitrogen Dioxide, three cases of fireworks, three boxes of small arms ammunition, and five cases of dynamite.   Each of the containers were identified with a separate color code/label.   The color/label code that appeared most was which of the following:**

A)   White (Poison A)   B)   Orange (Explosive C)
C)   Orange   D)   Red/white/blue

29. **Fire Chief Edwards upon arriving at the scene of the fire, called Lieutenant Clare to update him on the current status of the fire. Which of the following statements would be best to inform Chief Edwards of the current status?**

    A)   "The fire is in the smoldering stage and no people are currently left at the site."
    B)   "All victims have received the necessary vital medical attention and the fire is currently under control."
    C)   "The fire is almost extinguished and everyone is currently safe."
    D)   "No further assistance will be needed because we are handling the fire in a professional manner and all victims are getting the much needed medical attention."

30. **Firefighter O'Malley of the Pre-Planning Unit of the fire department recently gave a talk on fire prevention at a local grade school. He wanted to point out the danger of smoking in bed. Which of the following statements would be the most effective way to communicate this point to the students?**

    A)   "Smoking carelessly can be dangerous."
    B)   "Smoking in bed is probably not a good idea."
    C)   "Smoking in bed or in designated smoking areas is probably dangerous."
    D)   "Smoking is hazardous to your health."

31. **A firefighter responds to a traffic accident where two people are injured. What is the best way to report this information to his officer?**

    A)   "Two cars collided in an intersection which people were injured by it."
    B)   "An auto accident happened and then two people were very seriously injured in it."
    C)   "Car number 1 hit car number 2 in which two passengers were injured by the impact of the car into the other car."
    D)   "A Chevrolet Cavalier hit a Ford Taurus on the driver's side, injuring two passengers in the rear seat of the Taurus."

Charts

List of Hydrants Broken During the Past Year

Type of Hydrant A, B or C	Date Broken	Location: In front of
C	1/12	Edgar Winkler Park
B	2/14	apartment house
A	2/26	delicatessen
B	3/15	office building
A	4/12	apartment house
A	6/20	single family dwelling
C	6/23	single family dwelling
A	7/14	fire station
B	7/20	hardware store
A	8/3	funeral home
C	9/13	single family dwelling
C	11/30	supermarket
B	12/6	apartment house
B	12/18	department store

32. **Based on the information in the table, it is most accurate to say that:**

A)   Type A hydrants are broken most often in the winter, and Type B hydrants are broken most often in the summer
B)   Type A hydrants are broken most often in the summer, and Type B hydrants are broken most often in the winter
C)   Type C hydrants are broken most often in the winter, and Type B hydrants are broken most often in the summer
D)   Type C hydrants are broken most often in the winter, and Type A hydrants are broken most often in the summer

33. **Based on the information in the table, broken hydrants occur most often in front of:**

A)   apartment houses
B)   single family dwellings
C)   food stores
D)   non-food businesses

FIRE ALARM DATA FOR 1998

DISTRICTS	POPULATION	# OF BUILDINGS	% OF RESIDENCE	# OF FIRE ALARMS
V	9,624	1,925	77%	63
W	11,912	2,382	93%	123
X	6,489	1,294	72%	48
Y	8,564	1,713	89%	79
Z	5,831	1,166	78%	86

34. **Which district had the highest number of alarms relative to its population?**

A)   V   B)   W
C)   Y   D)   Z

35. **The average number of alarms received each month was:**

A)   26.5   B)   33.25
C)   41.75   D)   5

NUMBER OF TIMES DIFFERENT FIREFIGHTER APPARATUS WAS USED DURING YEARS 1992-1997

	1992	1993	1994	1995	1996	1997
Ladder	165	173	179	190	200	223
Tanker	26	27	25	22	21	22
Rescue	88	85	85	85	93	101
Engine	1,628	1,724	1,825	1,955	2,144	2,321

36. **The average rescue usage from 1992-1997 was most nearly:**

A)   85   B)   90
C)   92   D)   95

Math

37. **3.5% of 80 =**

A) .28
B) .028
C) 2.8
D) 28.0

38. **A rookie firefighter has spent the following number of hours studying for an upcoming entrance examination: Monday – 3-1/2 hours; Tuesday – 4 hours and 15 minutes; Wednesday – 2 hours; Thursday – 1 hour and 45 minutes; Friday – 1 hour; and Saturday – 2 hours and 15 minutes. She has been instructed that she will need to study 2-1/2 times more than the amount she has already studied. What will be the total number of hours required to be successful on the examination:**

A) 14.75 hours
B) 36.8 hours
C) 32 hours
D) 17.75 hours

39. **Multiply:**

   .016
x **.016**

A) .0256
B) .00256
C) .000256

40. **If A = 3 and B = 6 and C = 5, what is AB + BC?**

A) 540
B) 48
C) 20
D) 68

41. **The Metroland Fire Department responded to 12,486 fires during the year. it has been concluded from the Fire Prevention Bureau that 27% of those fires were categorized as preventable. What is the number of fires that could have been prevented?**

A) 3,371
B) 9,115
C) 1,972
D) 4,543

42. **8-3/4 divided by 2-1/2 =**

A) 1-7/8
B) 3-1/8
C) 3-1/2
D) 4-1/10

For question 43, find the numerical value of the following expression when a = 6, b = 5, c = 4, m = 3, n = 2

43.   **b ÷ (4 + mn)**

   A)   .5
   B)   .85
   C)   .3
   D)   1.5

Friction loss (FL) is the resistance encountered by the free flow of water in a fire hose. As a hose is used to move water from a source to a fire, its movement is hindered by the friction of water upon the hose. As a consequence, the velocity of the stream is constantly decreased by this friction as it moves through the hose. Friction loss is usually computed in terms of the drop in discharge pressure that occurs between the pumper truck and the hose nozzle in pounds per square inch (psi). The following formulas are used to calculate friction loss, in psi, for different size hoses. In each case, the formula gives the friction loss in psi per 100 feet of hose.

Friction loss per 100 feet of 1-1/2 inch hose: Drop the last digit form the gallons per minute (gpm) flowing through the hose, square the remaining value and then divide by three. For example, a 100 foot length of 1.5 inch hose with a 40 gpm nozzle would have a friction loss of: (4 x 4)/3 = 5.3, or approximately 5 psi.

Friction loss per 100 feet of 2-1/2 inch hose (2 x Q² + Q): FL = 2(Q x Q) + Q, where Q = $\dfrac{gpm}{100}$

Friction loss per 100 feet of 3 inch hose (.8 x Q² + 1): FL = .8(Q x Q) + 1, where Q = $\dfrac{gpm}{100}$ = Q

When two or more equal sized lines are running from the same source, divide the gpm by the number of supply lines and use the appropriate formulas above.

Based on the information above, determine the approximate friction loss in psi for questions 44-46:

44.   **100 ft of 2-1/2 inch hose at 200 gpm:**

   A)   7
   B)   10
   C)   6
   D)   23

45.   **400 ft of 1-1/2 inch hose at 90 gpm:**

   A)   17
   B)   82
   C)   108
   D)   125
   E)   92

46.   **100 ft of 3 inch hose at 400 gpm:**

   A)   15.3
   B)   16.7
   C)   13.8
   D)   21.7
   E)   41.4

47. If one gallon of water weighs 8.35 pounds, how many gallons of water would weigh 16,000 pounds?

   A) 2,016
   B) 1,916
   C) 3,428
   D) 2,874
   E) None

48. $\sqrt{(a+b)^2}$ - 2n

   A) 7
   B) 9
   C) 6
   D) 21

49. 5% of 20 =

   A) .01
   B) 0.1
   C) 1.0

50. Captain Edward Johnson recently purchased the following material in preparation for a first responder seminar concerning medical emergencies: $11.27 for paper; $2.93 for pencils/pens; $1.41 for chalk; $13.87 for folders; and $4.92 for transparencies. If the class is given over a 5-day period, what would be the average cost each day?

   A) $6.88
   B) $6.93
   C) $7.11

ANSWER KEY

Reading Comprehension

1. **C** – 10

2. **C** – 137A

3. **B** – Mrs. Renner's son

4. **C** – When a fire stream is required to protect occupants' escape.

5. **B** – Give a warning to the members of Engine 22 above you that the fire has spread into the third floor area.

6. **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.

7. **A** – An explosion where the base of the walls of a structure is blown outward.

8. **B** – A leak in the gas main to the heating system.

9. **A** – A high order concentrated explosion from some material such as dynamite.

10. **B** – The results of an implosion are more likely to be visible on the structure than the primary force of a concentrated explosion.

Information Ordering

11.   Answer is C.
1)   The hole should be located between the joists or rafters. Thus the joists or rafters should never be cut, as they are the main support for the roof.
2)   Locate the joists by sounding with the axe and noting the area that is solid. A solid sound will denote the location of the joist.
4)   Once the joists are located, an adequate size hole at least 4 feet should be marked on the roof with the pick head. The roof covering tar paper should be removed before proceeding with the cutting procedure.
3)   Upon identifying wood sheathing, the firefighter may begin cutting with the fire axe. The axe should not be swung as a wood cutter would use it, but with short quick strokes.

12.   Answer is D.
4)   Knots weaken a rope because the rope is bent in order to form the knot and the outside fibers take most of the strain at the bend.
5)   The knot that weakens the rope the least is one requiring the least abrupt bending.
1)   The bends that a rope undergoes in the formation of a knot or hitch are of three kinds: the bight, loop, and round turn.
3)   The bight is formed by simply bending the rope, keeping the sides parallel; the loop is made by crossing the sides of a bight; the round turn consists of the further bending of one side of a loop.
2)   Knots and hitches are formed by combining these elements in different ways so that the tight part of the rope bears on the free end to hold it in place.

13.   Answer is C.
4)   The need for respiratory protection in the fire service has increased greatly over the years.
2)   When homes were built of wood and contained furnishings of ordinary combustibles they produced fewer toxic products of combustion.
5)   These gases, though still unhealthy, were not lethal in small quantities.
1)   Such is not the case in our technological world of today.
6)   Plastics, synthetic materials, pesticides, and other hazardous products can be found everywhere.
3)   It has been well documented that most fire deaths occur from inhalation of smoke and toxic gases, rather than actual contact with fire.

Deductive Reasoning

14.   **C** – As stated in the types of alarms and times of occurrences chart, the severe fires were alarms #6, #7, and #8, all of which occurred in the early morning hours.

15.   **C** – After completing step #3 – shutting off the gas outside at meter or curb valve – firefighters would proceed to step #4 which involves opening windows and doors from outside to obtain ventilation.

16.   **C** – Of the choices listed, the correct statement concerning the gas emergency at the school is that firefighters operated an electrical switch within the building.

Judgment

17.   B – By maintaining an equal balance between your job as a firefighter and your home life, you are allowing yourself the opportunity to enjoy life more, which will reflect in a positive manner in both your home and work lives.

18.   **B** – Firefighters number one concern arriving at a fire is the life safety of the occupants. Therefore, the most appropriate first question to be asked by the officer would be if there was anybody presently in the house.

19.   **C** – First look over the inventory, organize it, and see what will be needed to accomplish the task within the given time frame. Even though your time frame is shorter, your approach should first be to organize it in order to successfully complete the task within the time frame.

20.   **D** – Your first concern should be for Firefighter B's health. By asking first if he is all right, you are expressing that concern. Then you should proceed to ask him how much he had to drink and how long ago.

21.   **D** – Although you cannot tell what is wrong by looking at the ankle, you should take proper safety precautions and prevent motion of the ankle because of the possibility of a fracture.

22.   **A** – Closing the doors between rooms will decrease the spread of the fire, allowing firefighters to concentrate on extinguishing the fire's point of origin.

23.   **A** – Your immediate attention should be checking for injuries to the occupants of the cars.

24.   **B** – Go up to your fellow firefighter and ask for an explanation of his behavior. Do not make rash judgments without seeing if there is a reason for the behavior.

Inductive Reasoning

25.   **D** – The landlord had a total of 24 violations during the 1st visit and a total of 8 violations during the 2nd visit, for a total of 32. The tenant had a total of 20 violations during the 1st visit and a total of 9 violations during the 2nd visit, for a total of 29.

26. **A** – The landlord was required to meet a total of 96 safety requirements, while the tenant was required to meet 69. The relationship of violations to number of requirements clearly indicates that the landlord was more effective than the tenants in meeting safety requirements.

27. **A** – Similarities that are helpful to solve questions of this nature are height, build, weight, hair, and similar clothes. As you can see in Report No. 1, the individual is a white male, age 30, 5'10. Key factors are weight-180 lbs, dark hair, moustache, black jacket. Remember when answering these questions that the descriptions do not have to be identical to the description of the suspect.

28. **B** – Three cases of fireworks and three boxes of small arms ammunition = 6

Verbal Reasoning

29. **B**

30. **A**

31. **D**

Charts

32. **B** – Hydrant A – 2/26, 4/12, 6/20, 7/14, 8/3; Hydrant B – 2/14, 3/15, 7/20, 12/6, 12/18; Hydrant C – 1/12, 6/23, 9/13, 11/30. From the chart, it indicates that Type A hydrants are broken most often in the summer; Type B hydrants are broken more in the summer. For hydrant C, there is no established pattern.

33. **D** – From the chart, broken hydrants most often occurred in front of non-food businesses, with a total of 4 occurrences.

34. **D** – For the number of alarms relative to population, you must divide the number of alarms by the population. For District V, the answer is .006; for District W, it is .010; District Y, .009; District Z, .0014.

35. **B** – In 1998, there were a total of 399 alarms. 399 ÷ 12 (months) = 33.25.

36. B – 88 + 85 + 85 + 85 + 93 + 101 = 537
537 ÷ 6 = 89.5

Math

37. **3.5% of 80 =**

```
 .035
x 80
 000
 280
2.80          (C)
```

38. **A rookie firefighter has spent the following number of hours studying for an upcoming entrance examination: Monday – 3-1/2 hours; Tuesday – 4 hours and 15 minutes; Wednesday – 2 hours; Thursday – 1 hour and 45 minutes; Friday – 1 hour; and Saturday – 2 hours and 15 minutes. She has been instructed that she will need to study 2-1/2 times more than the amount she has already studied. What will be the total number of hours required to be successful on the examination:**

Add total time spent = 14.75 hours and then multiply by 2.5 = 36.8   (B)

39. **Multiply:**

```
    .016
x  .016
    096
    016
    000
  .00256        (C)
```

Must add additional 0 because there are 6 decimal points

40. **If A = 3 and B = 6 and C = 5, what is AB + BC?**

AB = 3 x 6 = 18
BC = 6 x 5 = 30
30 + 18 = 48   (B)

41. **The Metroland Fire Department responded to 12,486 fires during the year. it has been concluded from the Fire Prevention Bureau that 27% of those fires were categorized as preventable. What is the number of fires that could have been prevented?**

12,486 x .27 = 3,371   (A)

42. **8-3/4 divided by 2-1/2 =**

8-3/4 = 35/4; 2-1/2 = 5/2
35/4 ÷ 5/2 = 35/4 x 2/5 = 70/20
70/20 = 3-10/20 or 3-1/2 when reduced   (C)

For question 43, find the numerical value of the following expression when a = 6, b = 5, c = 4, m = 3, n = 2

43. **b ÷ (4 + mn)**

5 ÷ (4 + (3x2))
5 ÷ (4 + 6)
5 ÷10 = 0.5   (A)

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Friction loss per 100 feet of 1-1/2 inch hose: Drop the last digit form the gallons per minute (gpm) flowing through the hose, square the remaining value and then divide by three. For example, a 100 foot length of 1.5 inch hose with a 40 gpm nozzle would have a friction loss of: (4 x 4)/3 = 5.3, or approximately 5 psi.

Friction loss per 100 feet of 2-1/2 inch hose (2 x Q² + Q): $FL = 2(Q \times Q) + Q$, where $Q = \dfrac{gpm}{100}$

Friction loss per 100 feet of 3 inch hose (.8 x Q² + 1): $FL = .8(Q \times Q) + 1$, where $Q = \dfrac{gpm}{100} = Q$

When two or more equal sized lines are running from the same source, divide the gpm by the number of supply lines and use the appropriate formulas above.

Based on the information above, determine the approximate friction loss in psi for questions 44-46:

44.   **100 ft of 2-1/2 inch hose at 200 gpm:**

    1) $\dfrac{200}{100} = 2$

    2)   2 x (2 x 2) + 2 = 10   (B)

45.   **400 ft of 1-1/2 inch hose at 90 gpm:**

    1)   90 = 9
    2)   9 x 9 = 81
    3)   81 ÷ 3 = 27
    4)   27 x 4 (4 hundred feet of hose) = 108   (C)

46.   **100 ft of 3 inch hose at 400 gpm:**

    1) $\dfrac{400}{100} = 4$

    2)   .8 x (4 x 4) + 1 = 13.8   (C)

47.   **If one gallon of water weighs 8.35 pounds, how many gallons of water would weigh 16,000 pounds?**

$$8.35\overline{)16,000}\,.00 \qquad 1916$$

        (B)

        <u>835</u>
        <u>7650</u>
        <u>7515</u>
        1350
        <u>835</u>
        5150
        <u>5010</u>

Use the following numerical values when answering question 48:
a = 6, b = 5, c = 4, m = 3, n = 2

48. $\sqrt{(a+b)}$ ² - **2n**

    1. $\sqrt{(a+b)}$ ² - **2 x 2 =**

    2.   **a(6) + b(5) x 2 = 121**

    3. $\sqrt{121}$ **= 11 x 11 = 121**

    4. $\sqrt{121}$ **- 4 =**

    5.   **11 - 4 = 7**   **(A)**

49. **5% of 20 =**

   20 x .05 = 1   (C)

50. **Captain Edward Johnson recently purchased the following material in preparation for a first responder seminar concerning medical emergencies: $11.27 for paper; $2.93 for pencils/pens; $1.41 for chalk; $13.87 for folders; and $4.92 for transparencies. If the class is given over a 5-day period, what would be the average cost each day?**

   $11.27 + $2.93 + $1.41 + $13.87 + $4.92 = $34.40
   $34.40 ÷ 5 = $6.88   (A)