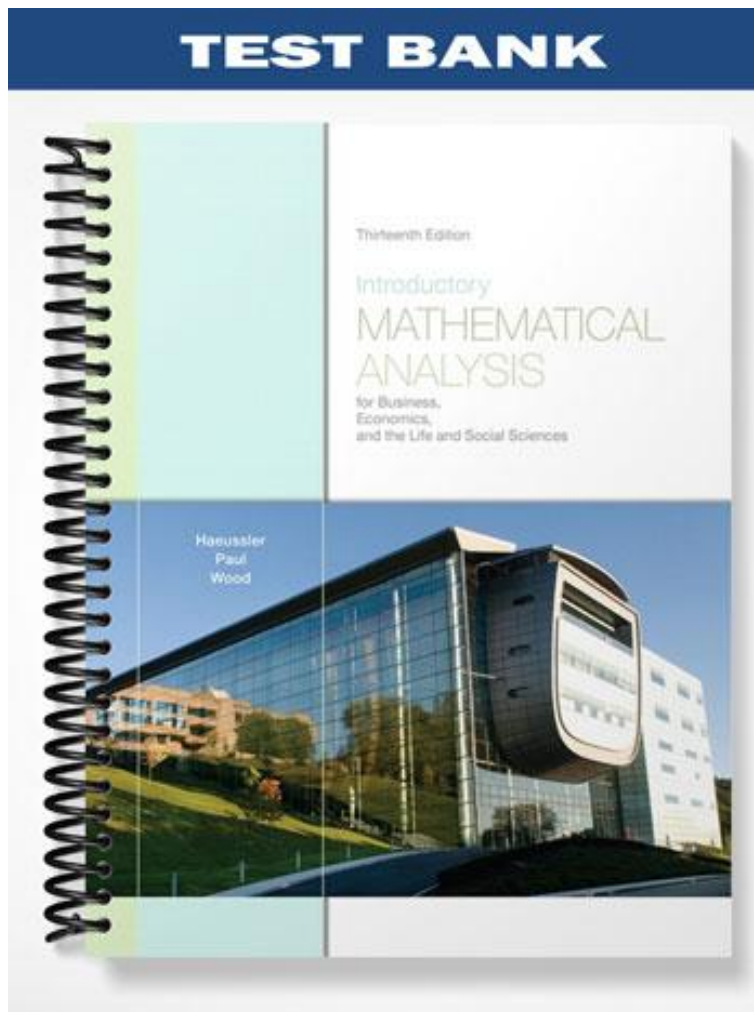


TEST BANK



SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Provide an appropriate response.

- 1) A company produces a product for which the variable cost per unit is \$3.50 and fixed cost is \$20,000 per year. Next year, the company wants the total cost to be \$48,000. How many units of the product should be made next year? 1) _____
Answer: 8000
- 2) A company makes car stereos. The manufacturing cost for each stereo is \$45. The company has fixed costs of \$4150 per month. How many stereos can it make next month for a total cost of \$10,000? 2) _____
Answer: 130
- 3) A certain machine can perform 34 chemical analyses per day, but a lab technician can perform only 7. Suppose a laboratory must make 110 analyses tomorrow and it has only two machines. How many technicians will be needed to complete the job? 3) _____
Answer: 6
- 4) The "current ratio" of a company is the value of its current assets divided by its current liabilities. A company has a current ratio of 2.5 and current liabilities of \$80,000. what are its current assets? 4) _____
Answer: \$200,000
- 5) The IQ (intelligence quotient) of a person is found by dividing his or her mental age by his or her chronological age and then multiplying that result by 100. For example, a person with a a mental age of 11 and a chronological age of 10 has an IQ of $\frac{11}{10} \cdot 100 = 110$. Find the mental age of a person with a chronological age of 12 and an IQ of 125. 5) _____
Answer: 15
- 6) Approximately 21% of the air we breathe is oxygen. To the nearest milliliter, how many milliliters of air contain 1 milliliter of oxygen? 6) _____
Answer: 5
- 7) A company manufactures two types of prefabricated houses: ranch and colonial. Last year they sold three times as many ranch models as they did colonial models. If a total of 2640 houses were sold last year, how many of each model were sold? 7) _____
Answer: 660 colonials, 1980 ranches
- 8) A company manufactures hair dryers. The manufacturing cost is \$9 per unit with a fixed cost of \$16,000. A hair dryer sells for \$15. If the company wants to earn a profit of \$50,000, how many dryers must be sold? 8) _____
Answer: 11,000
- 9) The owner of a 20-room motel, which is 70% occupied, decides to charge \$8 more than the single occupancy rate if two or more people occupy the room. This situation occurs in 75% of the occupied rooms, on the average. What should the two rates be so that the owner receives \$160,000 in annual income to cover expenses and yield a reasonable profit? (Assume that a year has 365 days and give your answer to the nearest dollar.) 9) _____
Answer: single rate, \$25; rate for two or more people, \$33
- 10) A company is establishing a dental plan for its employees. Under this plan the company will pay the first \$20

of an 10) _____
 employe _____
 e's _____
 dental-ca _____
 re _____
 expenses _____
 and 80% _____
 of all _____
 addition _____
 al _____
 dental-ca _____
 re _____
 expenses _____
 up to a _____
 maximu _____
 m total _____
 benefit _____
 payment _____
 of \$700. _____
 For an _____
 employe _____
 e, find _____
 the total _____
 dental-ca _____
 re _____
 expenses _____
 covered _____
 by this _____
 program. _____

Answer: \$870

- 11) An economics instructor told his class that the demand equation for a certain product is $p = 400 - q^2$ and its supply equation is $p = 20q + 100$. If the $400 - q^2$ is set equal to the $20q + 100$, then the positive solution to the resulting equation gives the "equilibrium quantity." The instructor asked his class to find this quantity. What answer should the class give? 11) _____
 Answer: $q = 10$
- 12) A sociologist is hired by a city to study different programs that aid the education of preschool-age children. The sociologist estimates that n years after the beginning of a particular program, p thousand preschoolers will be enrolled, where $p = \frac{5}{4}n(12 - n)$. How many years after the start of the program will 25,000 preschoolers *first* be enrolled? 12) _____
 Answer: 2
- 13) The product of two consecutive integers is 42. Find the integers. 13) _____
 Answer: 6 and 7, or -7 and -6
- 14) The sum of a number and its square is 12. Find the number. 14) _____
 Answer: -4 or 3
- 15) A rectangular plot, 4 meters by 8 meters, is to be used for a garden. The owner decides to put a pavement of

uniform 15) _____
width _____
inside _____
the entire _____
border so _____
that 12 _____
square _____
meters of _____
the plot _____
is left for _____
flowers. _____
How _____
wide _____
should _____
the _____
pavemen _____
t be? _____

Answer: 1 m

16) A person deposits \$50 in a bank and in two years it increases to \$56.18. If the bank compounds interest annually, what annual rate of interest does it pay? 16) _____

Answer: 6%

17) Researchers at a university need a 10,000 square meter rectangular plot on which to grow three hybrids of corn. The plot is to be enclosed by fencing and divided into three equal subplots by a pair of fences both parallel to the same pair of sides of the rectangle. If 600 meters of fencing are to be used for the project, what are the dimensions of the plot? 17) _____

Answer: 50 m by 200 m, or 100 m by 100 m

18) A theater owner charges \$3 for each ticket. Currently, only 100 people attend the theater daily. The owner believes that for each \$0.10 decrease per ticket, 10 more people will attend. If this is true and the capacity of the theater is 200, what should the price of a ticket be if the owner wants to receive \$375 daily from ticket sales? 18) _____

Answer: \$2.50

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

19) One of the most important defoliating insects is the gypsy moth caterpillar, which feeds on foliage of shade, forest, and fruit trees. A homeowner lives in an area in which the gypsy moth has become a problem. She wishes to spray the trees on her property before more defoliation occurs. She needs 128 ounces of a solution made up of 3 parts of insecticide A and 5 parts of insecticide B. The solution is then mixed with water. How many ounces of insecticide A should be used? 19) _____

- A) 38.4 B) 16 C) 48 D) 52 E) 68

Answer: C

20) A good oiled furniture finish contains two parts boiled linseed oil and one part turpentine. If you need a pint (16 fluid ounces) of this furniture finish, how many fluid ounces of turpentine are needed? 20) _____

- A) 3 B) 2 C) $\frac{1}{5}$ D) $\frac{2}{4}$ E) $\frac{1}{3}$

Answer: C

- 21) An electric utility company is going to locate its new power plant along a straight road connecting the towns of Exton and Whyton, which are 10 miles apart. For political reasons, the utility company will buy coal from both towns. The price of coal per ton from Exton is \$72.65 plus \$0.45 per mile for delivery. The price per ton from Whyton is \$72.25 plus \$0.25 per mile for delivery. How far (in miles) from Exton should the plant be located if the price of coal per ton delivered from Exton is to be equal to that from Whyton? (Hint: If d is the distance of the plant from Exton, then $10 - d$ is the distance from Whyton.) 21) _____
- A) $\frac{1}{2}$ B) $\frac{2}{3}$ C) 3 D) $\frac{1}{6}$ E) 4

Answer: C

- 22) Suppose consumers purchase q units of a manufacturer's product when the price per unit (in dollars) is $60 - 0.5q$. If no more than 75 units can be sold, then the number of units that must be sold in order that sales revenue be \$1000 is 22) _____
- A) 20. B) 50. C) 25. D) 75. E) 40.

Answer: A

- 23) A group of biologists studied the nutritional effects on rats that were fed a diet containing 10% protein. The protein was made up of yeast and corn flour. By changing the percentage P (expressed as a decimal) of yeast in the protein mix, the group estimated that the average weight gain g (in grams) of a rat over a period of time was given by $g = -200P^2 + 200P + 20$. What percentage of yeast gave an average weight gain of 70 grams? 23) _____
- A) 50% B) 60% C) 65% D) 70% E) 80%

Answer: A

- 24) A company will enclose a rectangular area of 12,800 square feet in the rear of its plant. One side will be bounded by the building and the other three sides by fencing. Suppose that 400 feet of fencing will be used and that the side of the building has a length of 100 ft. What will be the dimension (in feet) of the side of the rectangle that is opposite the building? 24) _____
- A) 20 B) 40 C) 60 D) 80 E) 90

Answer: D

- 25) Imperial Educational Services (I.E.S.) wants to offer a workshop in pollution control to key personnel at Acme Corporation. I.E.S. will offer the course to thirty persons at a charge of \$50 each. Moreover, I.E.S. will agree to reduce the charge for *everybody* by \$1.00 for each person over the thirty who attends, up to a total group size of fifty. It has been determined that the greatest revenue the I.E.S. can receive is \$1600. What group size will give this revenue? 25) _____
- A) 34 B) 36 C) 40 D) 44 E) 48

Answer: C

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

- 26) The sum of 3 integers is 27. The second is 3 more than the first, and the third is two more than twice the second integer. Find the three integers. 26) _____
- Answer: 4, 7, 16

- 27) A rectangular field is twice as long as it is wide. Find the dimensions of the field if it needs 600 feet of fencing to go around the field. 27) _____
- Answer: 200×100

- 28) The sum of two integers is 21. The second integer is three more than twice the first integer. Find both of the integers. 28) _____

Answer: 6, 15

- 29) An elder brother is twice as old as his younger brother at the present. Six years ago the elder brother was three times as old as the younger brother. Find the present age of the brothers. 29) _____

Answer: 12, 24

- 30) A company produces and sells q units of its product. If the variable cost is \$4/unit, fixed costs are \$4800 and the selling price is \$28/unit, find the number of units the company must produce to split even (i.e., zero profit). 30) _____

Answer: 200 units

- 31) A person wishes to deposit a total of \$10,000 in two accounts. The savings account pays yearly interest of 4% and fixed certificates of deposit pay a yearly interest rate of 7%. How much should the person deposit in each account so that he gets a total of \$502 interest at the end of the year? 31) _____

Answer: Savings Account = 6600
Certificate of Deposit = 3400

- 32) The sum of two real numbers is 12. The sum of their reciprocals is $\frac{1}{3}$. Find the two numbers. 32) _____

Answer: 6, 6

- 33) A bank loaned \$3320 to a company for the development of two products. If the loan for product A was \$1520 more than the other, how much was loaned for each product? 33) _____

Answer: 900, 2420

- 34) A chef must prepare 10 cups of a sauce. The recipe calls for 1 part wine and 4 parts beef stock. How much of each ingredient should be used? 34) _____

Answer: 2 cups wine and 8 cups beef stock

- 35) A baker must prepare 6 cups of pie filling. The recipe calls for $\frac{1}{2}$ cup of sugar for each 4 cups of fruit. How much of each ingredient should be used? 35) _____

Answer: $\frac{2}{3}$ cup of sugar and 5 $\frac{1}{3}$ cups of fruit

- 36) A chemist must prepare 540 ml of a chemical solution. It is to be made up of 4 parts acid and 5 parts distilled water. How much of each should be used? 36) _____

Answer: 240 ml of acid and 300 ml of water

- 37) A metallurgist is preparing 63 kg of an alloy. It must consist of 3 parts aluminum and 4 parts copper. How much of each metal should be used? 37) _____

Answer: 27 kg aluminum and 36 kg copper

- 38) A homeowner needs to make a cover for a circular pool with a diameter of 18 feet. How much cover fabric should be ordered if the cover must extend 2 feet beyond the edge of the pool? (Hint: The area A of a circle is πr^2 , where r is the radius. Assume $\pi = 3.14$, and round to the nearest square foot.) 38) _____

Answer: 380 sq ft

- 39) A flower border of uniform width is to be added to a rectangular lawn, 30 feet by 40 feet. How wide should the border be so that 600 sq ft of lawn remains?
Answer: 5 ft wide 39) _____
- 40) A rectangular deck attached to a ski lodge is 22 m long and 10 m wide. Planter boxes will be added along the 3 open sides, which include 1 long side and both short sides. How wide can the boxes be to leave 180 sq m of deck space?
Answer: 1 m wide 40) _____
- 41) A fence is to be placed around a rectangular plot so that 2700 sq ft are enclosed. How much fencing must be used if the plot is 3 times as long as it is wide?
Answer: 240 ft 41) _____
- 42) A company's revenue from the sale of interior doors is \$98 per door. The cost of producing the doors is \$48 per door with \$12,000 in fixed costs. How many doors must the company sell in order to break even?
Answer: 240 doors 42) _____
- 43) A car dealer has 20 new automobiles which she purchased for \$12,000 each. If she sells 16 of them at a profit of 20%, for how much must she sell the remaining 4 to have an average profit of 18%?
Answer: \$13,200 43) _____
- 44) A painting contractor completed two jobs at \$480 each. For one of them, this represented a 20% loss; for the other it was a 20% profit (based on his cost for each job). How much did he make or lose on the two jobs?
Answer: Lost \$40 44) _____
- 45) An appliance company makes coffee makers for which the variable cost per unit is \$12 and the fixed cost is \$92,000. What should the selling price be for the company to earn a profit of \$88,000 on 10,000 units?
Answer: \$30 45) _____
- 46) A bicycle costs a wholesaler \$63 and the wholesale selling price includes a markup of 25% of the wholesale selling price. What should be the retailer's selling price in order to make a profit of 30%?
Answer: \$109.20 46) _____
- 47) A kitchen cabinet maker wants to establish a list price for a standard cabinet so that the selling price gives a trade discount of 10% of the list price. If he makes a markup of 20% of the selling price, and his cost is \$144, what list price should he charge?
Answer: \$200 47) _____
- 48) A recliner costs a wholesaler \$189 and her markup is 10% of her selling price. If the retailer's markup is 30% of his selling price for the item, what is the retailer's selling price?
Answer: \$300 48) _____
- 49) A computer keyboard retails for \$48.54, which includes a markup of 40% for the retailer and a markup of 20% for the wholesaler. What did the keyboard cost the wholesaler?
Answer: Approximately \$28.89 49) _____

- 50) A woman has \$90,000 to invest in two mutual funds. One fund is low-risk and has an annual yield of 10%. The second fund is medium-risk and has a 15% annual yield. How much should she invest in each fund if she would like to earn \$10,000 per year from her investments? 50) _____
Answer: \$70,000 in the low-risk fund and \$20,000 in the medium-risk fund
- 51) A retired couple has \$192,000 to invest. A safe investment yields 9.5% per year, but a riskier investment yields 12.5% per year. How much should they invest at each rate to earn \$21,000 per year? 51) _____
Answer: \$100,000 in the safe investment and \$92,000 in the riskier investment
- 52) A father wants to invest \$50,000 in order to earn \$4000 per year to help pay for his daughter's college education. He places \$30,000 in a savings account earning 5% per year. He wants to place the rest of his investment in a mutual fund. How much will the mutual fund have to earn for him to make his goal? 52) _____
Answer: 12.5%
- 53) A teenager has \$10,000 invested in a checking account paying 2.5% per year and a savings account paying 6.5% per year. The total interest earned in the two accounts at the end of the year was equivalent to an annual rate of 6% on the entire \$10,000. How much was invested in each account? 53) _____
Answer: \$1250 in the checking account and \$8750 in the savings account.
- 54) A county decides to retire some of its road construction bonds in 2 years. At that time \$4,840,000 will be required. If it presently sets aside \$4,000,000, at what annual rate of interest, compounded annually, will this money need to earn in order for its future value to be sufficient to retire the bonds? 54) _____
Answer: 10%
- 55) A biotech company will require \$10,112,400 to expand its research facility in 2 years. It has \$9,000,000 to invest now for this purpose. At what annual rate of interest, compounded annually, should it invest this amount to be ready for construction in 2 years? 55) _____
Answer: 6%
- 56) A corporation plans to buy back some of its stock in 2 years for \$1,081,600. It plans to invest \$1,000,000 this year to have the necessary capital for this move. At what annual rate of interest, compounded annually, should it invest this million dollars to earn enough for its stock re-purchase? 56) _____
Answer: 4%
- 57) A homeowner will need \$37,632 in 2 years to pay off a balloon mortgage on her house, but she has only saved \$30,000 so far. At what annual interest rate, compounded annually, should she invest her savings in order to pay off her mortgage in 2 years? 57) _____
Answer: 12%
- 58) A 100 unit high-rise apartment building which has no vacancy has come under new management. The new management company wants to receive \$101,500 in monthly rent. They estimate that for each \$50 per month increase over the current \$950 per month rent, there will be three vacancies with no possibility of filling them. What rent should they charge for each apartment? 58) _____

Answer: \$1166.67 or \$1450

- 59) The owner of an 85 unit apartment building must raise the rent to cover an increase in property taxes of \$9000 per year. At the current rent of \$600 per month, each \$30 per month increase will create one vacancy with no possibility of filling it. By how much should he raise the rent for these apartments? 59) _____

Answer: \$150 or \$1800

- 60) Rooms in a 130 unit student housing complex are fully rented at \$300 per month. The university is raising rates to produce \$1920 more in monthly income from these units. Each \$10 per month increase will create two vacancies with no possibility of filling them. What should be charged for the new rent? 60) _____

Answer: \$330 or \$620

- 61) An office complex consists of 300 units which rent at \$760 per month with no vacancies. Each \$20 per month increase will create four vacancies with no possibility of filling them. The owner wishes to receive \$233,600 per month from the complex. How much should the rent be increased to meet this goal? 61) _____

Answer: \$40 or \$700

- 62) Solve: $7 - 2x < 9$ 62) _____
Answer: $x > -1$

- 63) Solve: $5x - 2 \geq 14 - 3x$ 63) _____
Answer: $x \geq 2$

- 64) Solve: $4x - 3 < -2(1 - x)$ 64) _____
Answer: $\frac{1}{2}$
 $x <$

- 65) Solve: $3(4x - 1) \geq 2(x + 4)$ 65) _____
Answer: $\frac{11}{10}$
 $x \geq$

- 66) Solve: $[-2(x - 1) - 7] \leq 9x - (3 - x)$ 66) _____
Answer: $x \geq 1$

- 67) 67) _____
Solve: $2(x - 8) + 5 \leq -4\left(2 - \frac{x}{2}\right)$
Answer: $-\infty < x < \infty$

- 68) 68) _____
Solve: $z - 2 \geq \frac{2z - 3}{2}$
Answer: no solution

- 69) 69) _____
Solve: $\frac{t - 1}{4} + 3 > \frac{t}{3}$
Answer: $t < 33$

- 70) Sol
ve:

$$\frac{6x-2}{3} \leq \frac{1}{4}$$

70) Answer: $x \leq \frac{5}{24}$

71) Solve: $\frac{4-2x}{-5} > x+2$
Answer: $x < -\frac{14}{3}$

71) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

72) The solution of $5x > 2x$ is 72) _____
 A) $x < \frac{1}{3}$ B) $x > -3$ C) $-\infty < x < \infty$ D) $x > 0$ E) $x < 0$

Answer: D

73) The solution of $2(4 - 3x) \geq 10 + 4(x + 1)$ is 73) _____
 A) $x \geq \frac{3}{10}$ B) $x \geq \frac{1}{5}$ C) $x \leq -\frac{3}{5}$ D) $x \geq \frac{3}{5}$ E) $x \geq -\frac{1}{5}$

Answer: C

74) The solution of $3x - 5 \geq x - (4 - 2x)$ is 74) _____
 A) $x \leq -\frac{1}{6}$
 B) $x \geq \frac{1}{6}$
 C) $x \geq \frac{1}{4}$

D) no solution

E) $-\infty < x < \infty$

Answer: D

75) The solution of $3 - 4(x + 5) < 3x + 7(4 - x)$ is 75) _____
 A) no solution
 B) $x < -\frac{28}{17}$
 C) $x > \frac{28}{17}$

D) $x < 45$

E) $-\infty < x < \infty$

Answer: E

76) The solution of $-2(x - 3) < x$ is 76) _____
 A) $x > 2$ B) $x < 2$ C) $x < -2$ D) $-\infty < x < \infty$ E) $x > -2$

Answer: A

77) $\frac{1-3x}{2} > \frac{4x+2}{5}$ is 77) _____
 The solution of
 A) $x > \frac{1}{23}$ B) $x < \frac{1}{23}$ C) $x > -\frac{1}{23}$ D) $x < \frac{4}{9}$ E) $x < -\frac{1}{23}$
 Answer: B

78) $\frac{2x-1}{-2} < \frac{4x-3}{2}$ is 78) _____
 The solution of
 A) $x > 1$ B) $x < \frac{2}{3}$ C) $x > \frac{2}{3}$ D) $x < \frac{2}{3}$ E) $x < 1$
 Answer: C

79) $\frac{2x-3}{-4} \leq 2-7x$ is 79) _____
 The solution of
 A) $x \geq \frac{5}{26}$ B) $x \geq 1$ C) $x \leq 1$ D) $x \leq \frac{5}{26}$ E) \emptyset
 Answer: D

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

80) Solve: $0.2[5(x-1)-4] < 0.8(x+1)$ 80) _____
 Answer: $x < 13$

81) Solve: $0.3[3-2x] \geq 4[1-0.3x]$ 81) _____
 Answer: $x \geq 5.167$

82) Solve: $3(x-5)+7 < 4(3-x)+7x-20$ 82) _____
 Answer: no solution

83) Solve: $11(3-x)+2 \leq 2(3-5x)+29-x$ 83) _____
 Answer: $-\infty < x < \infty$

84) Solve: $(1-2x)^2 - 4(3-x)^2 \geq 5$ 84) _____
 Answer: $x \geq 2$

85) $\frac{a}{2} - \frac{a}{3} < \frac{a}{5} + 1$ 85) _____
 Solve:
 Answer: $a > -30$

86) What Celsius temperature C corresponds to a Fahrenheit temperature of $F = 98.6$ degrees 86) _____
 (normal body temperature) if $F = \frac{9}{5}C + 32$?
 Answer: 37°C

87) Two resistors R_1 and R_2 are connected in parallel in an electrical circuit. The net 87) _____
 resistance R is given by $\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2}$. If $R_1 = 20$ ohms, what values of R_2 will create a
 net resistance of less than 10 ohms?
 Answer: $R_2 < 20$ ohms

The 1996 tax brackets for a single person are given in the following table.

Taxable Income I	Tax T
1. 0 - 24,000	15% (I)
2. 24,000- 58,150	28% (I - 24,000) + 3600
3. 58,150- 121,300	31% (I - 58,150) + 13,162
4. 121,300- 263,750	36% (I - 121,300) + 32,738.50
5. over 263,750	39.6% (I - 263,750) + 84,020.50

Source: 1040 Forms and Instructions, IRS, 1996

88) Write the income range for line 1 as an inequality. Write the inequality that represents the tax owed. 88) _____

Answer: $0 \leq I \leq 24,000$; $0 \leq T \leq 3600$

89) Write the income range for line 2 as an inequality. Write the inequality that represents the tax owed. 89) _____

Answer: $24,000 < I \leq 58,150$; $3600 < T \leq 13,162$

90) Write the income range for line 3 as an inequality. Write the inequality that represents the tax owed. 90) _____

Answer: $58,150 < I \leq 121,300$; $13,162 < T \leq 32,738.50$

91) Write the income range for line 5 as an inequality. Write the inequality that represents the tax owed. 91) _____

Answer: $I > 263,750$; $T > 84,020.50$

A zoo veterinarian can purchase 4 different animal foods with various nutrient values for the zoo's grazing animals.

Let x_1 represent the number of bags of food 1, x_2 represent the number of bags of food 2, and so on. The number of bags of each food needed can be described by the following:

$$x_1 = 150 - x_4 \geq 0$$

$$x_2 = 3x_4 - 210 \geq 0$$

$$x_3 = x_4 + 60 \geq 0$$

92) Solve each inequality for x_4 . 92) _____

Answer: $x_4 \leq 150$

$$x_4 \geq 70$$

$$x_4 \geq -60$$

93) Determine an interval for x_4 that satisfies all of these inequalities. 93) _____

Answer: $70 \leq x_4 \leq 150$

94) Develop an interval for each of the other variables. 94) _____

Answer: $0 \leq x_1 \leq 80$; $0 \leq x_2 \leq 240$; $130 \leq x_3 \leq 210$

Provide an appropriate response.

95) Hooke's Law of springs states that the force F (in pounds) required to stretch a spring x inches beyond its natural length is $F = kx$, where k is the "spring constant" for a given spring. If a certain spring has a spring constant k of 6.5 and $13 \leq F \leq 26$, what are the corresponding values for x ? 95) _____

Answer: $2 \leq x \leq 4$

96) The concentration of a certain drug in the bloodstream t hours after it is injected is given 96) _____
 by $C = \frac{5.4t}{t+1}$ mg/L. Determine when the concentration reaches the maximum therapeutic level of 1.8 mg/L.
 Answer: $\frac{1}{2}$
 $t > \frac{1}{2}$ hour

97) Ohm's Law in electrical theory states that $V = IR$, where R is the resistance (in ohms) of an object, V is the potential difference (in volts) across the object, and I is the current (in amperes) that flows through it. If the voltage is 220 volts, what values for the current will result in a resistance that is less than 20 ohms? 97) _____
 Answer: $I > 11$ amps

98) A company produces a product at a cost of \$6 per unit. If fixed costs are \$20,000 and each unit sells at \$8, at least how many units must be sold in order to earn a profit? 98) _____
 Answer: 10,001

99) A manufacturer has 4000 units of product x in stock and is now selling it at \$10 per unit. Next month the unit price will increase by \$2. The manufacturer wants the total revenue received from the sale of the 4000 units to be no less than \$45,000. What is the maximum number of units that can be sold this month? 99) _____
 Answer: 1500

100) Suppose a company offers you a sales position with your choice of two methods of determining your yearly salary. One method pays \$15,000 plus a bonus of 3% of your yearly sales. The other method pays a straight 13% commission of your sales. For what yearly sales level is it better to choose the first method? 100) _____
 Answer: yearly sales under \$150,000

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

101) A company will manufacture a total of 5000 units of its product at plants A and B. At plant A the unit cost for labor and material combined is \$2.50, while at plant B it is \$3.00. The fixed costs at plant A are \$6000 and at plant B they are \$8000. Between the two plants the company has decided to allot no more than \$28,000 for total costs. The minimum number of units that must be produced at plant A is 101) _____
 A) 2546. B) 1871. C) 2545. D) 2000. E) 2500.
 Answer: D

102) The "current ratio" of a company is the ratio of its current assets to its current liabilities. Suppose a company has current assets of \$250,000 and current liabilities of \$100,000. If the company wants to make a short-term loan and have their current ratio no less than 2.2, what is the maximum amount it can borrow? (Note: The funds they receive are considered as current assets and the loan as a current liability.) 102) _____
 A) \$15,000 B) \$20,000 C) \$25,000 D) \$30,000 E) \$33,000
 Answer: C

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

103) Suppose a person has \$23 in his pocket. What is the maximum number of pizzas that person can order if each pizza costs \$4.39? 103) _____
 Answer: 5

- 104) The relationship between Fahrenheit and Celsius temperature is given by the formula $\frac{F - 32}{180} = \frac{C}{100}$. Normal body temperature is $F \geq 98.6$. Find the corresponding Celsius temperature.
Answer: $C \geq 37$ 104) _____
- 105) A student receives grades of 63, 75, 66 in three midterms (out of 100 points). The final exam is worth 200 points. The student needs at least 70% to get a grade of C in the course. How many points, at least, must the student obtain (out of 200 points) to get a grade of C?
Answer: 146 105) _____
- 106) A company manufactures water filters that cost \$15 for labor and material, plus \$50,000 in fixed costs. If they sell the water filter for \$20, how many must be sold to make a profit?
Answer: at least 10,000 filters 106) _____
- 107) A pet food company needs to calculate how much to charge for a bag of rabbit food that costs \$10 to produce. The fixed costs involved in production are \$15,000. They want to start making a profit after they have sold 4,000 bags of rabbit food. What is the least amount they can charge to make this goal?
Answer: \$13.75 per bag 107) _____
- 108) A company produces plastic parts for automobiles. The manufacturing process for one part costs \$28 per part for labor and material, plus \$36,000 in fixed costs. Industry competition dictates that they can charge no more than \$42 for this part. How much should they reduce the material and labor costs to satisfy a company policy of earning a profit after selling 2,000 units?
Answer: \$4 108) _____
- 109) An electronics company manufactures personal CD players which sell for \$89. If the production line has \$81,000 in fixed costs and \$44 per player in labor and materials, how many must they sell to make a profit?
Answer: 1800 players 109) _____
- 110) A homeowner must decide whether to buy or rent a garden rototiller. If she rents the machine, the rental fee is \$25 per day, and the daily cost to use it is \$5 for gas. If she were to buy the machine, the purchase price is \$650, and the daily cost is \$7 for gas, oil, and maintenance. On which day of use would the rental costs become greater than the ownership costs?
Answer: 29th day 110) _____
- 111) Car rental company A rents a compact car for \$32 per day, while rental company B rents an equivalent car for \$21 per day plus an initial fee of \$55. If a customer wants the cheaper rate, when should he rent from company B?
Answer: The rates are the same for a 5 day rental. Use company B when renting for more than 5 days. 111) _____
- 112) A woodworker must decide whether to buy or rent a table saw. If he rents the saw, the rental fee is \$30 per weekend, and the charge for delivery and pickup is \$15. If he were to buy the saw, the purchase price is \$960 plus \$5 each weekend for new saw blades and maintenance. After how many weekends of use would it cost less to buy the saw than rent 112) _____

Answer: 24 weekends

- 113) Party supply store A rents tables for \$10 per day and chairs for \$1.50 per day. Party supply store B rents tables for \$9 per day and chairs for \$1.25 per day, plus a \$36 delivery charge. After how many days is it more expensive to rent 3 tables and 24 chairs from store A? 113) _____

Answer: 4 days

- 114) The CEO of an office equipment company decides to borrow money to expand their manufacturing facility. The company has current assets of \$4,000,000 and current liabilities of \$640,000. How much can they borrow if they want their current ratio of assets to liabilities to be no less than 3? (Note: (1) The *current ratio* is the ratio of a business' current assets to its current liabilities; (2) The funds they receive are considered as current assets and the loan as a current liability.) 114) _____

Answer: up to \$1,040,000

- 115) The president of a computer company decides to borrow money to expand their research facility. The company has current assets of \$24,920,000 and current liabilities of \$6,000,000. How much can they borrow if they want their current ratio of assets to liabilities to be no less than 3.2? (Note: The funds they receive are considered as current assets and the loan as a current liability). 115) _____

Answer: up to \$2,600,000

- 116) The owner of a floral shop wants to take out a loan to purchase a new delivery truck. The company has current assets of \$121,600 and current liabilities of \$28,000. How much can he borrow if he wants his current ratio of assets to liabilities to be no less than 2.8? (Note: The funds they receive are considered as current assets and the loan as a current liability.) 116) _____

Answer: up to \$24,000

- 117) The owners of a bakery need to borrow money to purchase a new oven. The bakery has current assets of \$52,000 and current liabilities of \$15,000. How much can they borrow if they want their current ratio of assets to liabilities to be no less than 2.6? (Note: The funds they receive are considered as current assets and the loan as a current liability.) 117) _____

Answer: up to \$8125

- 118) A newspaper publisher finds that the cost of printing and distributing each copy of its morning paper is \$0.22. The revenue from subscribers is \$0.20 per copy. The advertising revenue is 12% of the revenue received from subscribers for all copies sold beyond 15,000. Find the smallest number of copies which must be sold to break even. 118) _____

Answer: 90,000 copies

- 119) The cost of producing each copy of a travel guide is \$0.95. It is sold to travel agents for \$0.90 each, and the amount received for advertising is 10% of the amount received for all guides sold beyond 12,000. Find the fewest number of travel guides that must be sold to break even. 119) _____

Answer: 27,000 copies

- 120) A monthly real estate guide is published for \$1.40 per issue. It is sold to real estate agents for \$1.25 each. The advertising revenue is 15% of the amount received for all guides sold beyond 2,000. Find the fewest number of real estate guides that must be sold to even. 120) _____

Answer: 2,000 guides

- 120) _____
 Answer: 10,000 copies
- 121) The cost of publishing each copy of a magazine is \$1.75. The revenue from dealers is \$1.60 for each copy. The amount received for advertising is 10% of the amount received for all magazines sold beyond 1,000. Find the smallest number of copies that must be sold to break even.
 Answer: 16,000 copies
- 122) A manufacturer makes CD players. If the variable costs are \$25 per player and the fixed costs are \$50,000, what is the minimum number of CD players that must be sold to make a profit of \$75,000 given that the CD players sell for \$45 per player?
 Answer: 6,251
- 123) Simplify: $|-8|$
 Answer: 8
- 124) Simplify: $|9^{-1}|$
 Answer: $\frac{1}{9}$
- 125) Simplify: $|(-3 - 7)/2|$
 Answer: 5
- 126) Simplify: $|3 - 8| - |8 - 3|$
 Answer: 0
- 127) Write without the absolute-value symbol: $|1 - \sqrt{2}|$
 Answer: $\sqrt{2} - 1$
- 128) Solve: $|x| < 6$
 Answer: $-6 < x < 6$
- 129) Solve: $|4x - 3| = 7$
 Answer: $\frac{5}{2}$, -1
- 130) Solve: $|4 - x| = 10$
 Answer: $x = -6, 14$
- 131) Solve: $\left|\frac{2}{3}x - 1\right| = 4$
 Answer: $\frac{9}{2}$, $\frac{15}{2}$
 $x = \frac{9}{2}, \frac{15}{2}$
- 132) Solve: $\left|-\frac{x}{3}\right| < 2$
 Answer: $-6 < x < 6$
- 133) Solve: $|2x - 3| < -2$
- 121) _____
- 122) _____
- 123) _____
- 124) _____
- 125) _____
- 126) _____
- 127) _____
- 128) _____
- 129) _____
- 130) _____
- 131) _____
- 132) _____
- 133) _____

Answer: no solution

134) Solve: $|x - 6| \leq 6$ 134) _____
Answer: $0 \leq x \leq 12$

135)
$$\text{Solve: } \left| \frac{2x - 3}{4} \right| \leq 1$$
 135) _____
Answer:
$$-\frac{1}{2} \leq x \leq \frac{7}{2}$$

136) Solve: $|5 - 2x| > 3$ 136) _____
Answer: $x < 1, x > 4$

137) Solve: $|x + 7| > -2$ 137) _____
Answer: $-\infty < x < \infty$

138)
$$\text{Solve: } \left| \frac{x + 4}{3} \right| > 2$$
 138) _____
Answer: $x < -10, x > 2$

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

139) If $x - 2$ is less than 4 units from 0, then 139) _____
A) $|x| < 6$. B) $|x - 2| < 4$. C) $|x - 6| < 0$. D) $|x - 2| > 4$. E) $|x - 6| > 0$.
Answer: B

140) If $x > 10$ or $x < -10$, then 140) _____
A) $|x - 10| < 0$.
B) $|x| < 10$.
C) $|x - 10| < 10$.
D) $|x - 10| < -10$.
E) $|x| > 10$.
Answer: E

141) The solution of $|4x + 9| = 3$ is 141) _____
A) no solution
B) $x = -3, -\frac{3}{2}$ only
C) $-3 \leq x \leq -\frac{3}{2}$
D) $x = -\frac{3}{2}$ only
E) $-\infty < x < \infty$
Answer: B

142) The solution of $|2x - 9| < 3$ is 142) _____
A) $x < 3, x > 6$
B) $x > 3$
C) $x < 6$
D) $3 < x < 6$

E) $0 < x < 3$

Answer: D

143) The solution of $|2 - x| \leq 5$ is

143) _____

A) $0 \leq x \leq 3$

B) $-7 \leq x \leq 3$

C) $-3 \leq x \leq 7$

D) $x \leq -7, x \geq 3$

E) $x \leq -3, x \geq 7$

Answer: C

144) The solution of $|2x - 3| \leq -2$ is

144) _____

A) $\frac{1}{2} \leq x \leq \frac{1}{2}$

B) $\frac{1}{2} \leq x \leq \frac{5}{5}$

C) $-\infty < x < \infty$

D) $-\frac{1}{2} \leq x \leq \frac{1}{2}$

E) no solution

Answer: E

145) The solution of $|4 - 3x| \geq -5$ is

145) _____

A) $x < -3, x > 3$

B) $x \geq 3$

C) $-\infty < x < \infty$

D) $-3 \leq x \leq 3$

E) no solution

Answer: C

146) The solution of $\left| \frac{5x + 1}{3} \right| \geq 2$ is

146) _____

A) $x \geq 1$

B) $x \leq -1, x \geq \frac{7}{5}$

C) $-1 \leq x \leq \frac{7}{5}$

D) $x \leq -\frac{7}{5}, x \geq 1$

E) $-\frac{7}{5} \leq x \leq 1$

Answer: D

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

147) Solve: $-2|2x - 1| \leq -6$

147) _____

Answer: $x \leq -1$ or $x \geq 2$

148) Solve: $\left| \frac{x + 1}{-3} \right| < 5$

148) _____

Answer: $-16 < x < 14$

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 149) If x lies in the interval $(-2, 8)$, then 149) _____
- A) $|x - 3| \leq 5$
B) $|x - 3| \geq 5$
C) $|x - 3| > 5$
D) $|x - 3| < 5$
E) none of the above
- Answer: D

- 150) If $x \leq -2$ or $x \geq 8$, then 150) _____
- A) $|x - 3| \geq 5$
B) $|x - 3| > 5$
C) $|x - 3| < 5$
D) $|x - 3| \leq 5$
E) none of the above
- Answer: A

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

- 151) Solve: $|3 - x| > 5$ 151) _____
Answer: $x < -2$ or $x > 8$
- 152) Solve: x plus seven is a number 3 units from zero. 152) _____
Answer: $x = -4$ or $x = -10$
- 153) Solve: Six plus three times x is a number 12 units from zero. 153) _____
Answer: $x = 2$ or $x = -6$
- 154) Solve: Two times x plus nine is a number 13 units from zero. 154) _____
Answer: $x = 2$ or $x = -11$
- 155) Solve: Three times x plus four is a number -4 units from zero. 155) _____
Answer: A distance cannot be negative, so there is no solution.
- 156) The number x minus four is less than 6 units from zero. What are the possible values for x ? 156) _____
Answer: $-2 < x < 10$
- 157) Ten plus three times x is a number that is at most 11 units from 0. What are the possible values for x ? 157) _____
Answer: $-\frac{7}{3} \leq x \leq \frac{1}{3}$
- 158) The number five minus two times x is less than 9 units from zero. What are the possible values for x ? 158) _____
Answer: $-2 < x < 7$
- 159) Six minus four times x is a number that is at most 14 units from zero. What are the possible values for x ? 159) _____
Answer: $-2 \leq x \leq 5$

- 160) The number x plus eight is at least 4 units from zero. What are the possible values for x ? 160) _____
 Answer: $x \leq -12$ or $x \geq -4$
- 161) Three minus x is a number at least 6 units from zero. What are the possible values for x ? 161) _____
 Answer: $x \leq -3$ or $x \geq 9$
- 162) Three times x plus five is a number that is more than 4 units from zero. What are the possible values for x ? 162) _____
 Answer: $x < -3$ or $x > -\frac{1}{3}$
- 163) Three minus three times x is a number that is more than 6 units from zero. What are the possible values for x ? 163) _____
 Answer: $x < -1$ or $x > 3$

Express the problem using absolute value notation.

- 164) For safety reasons, the arrival time of commuter train A at a station must be at least 6 minutes different from the 6:00 P.M. arrival of train B. 164) _____
 Answer: $|T_A - 6:00| \geq 6 \text{ min}$
- 165) The absolute value of the difference of two numbers is equal to the absolute value of the difference of the two numbers in reverse order. 165) _____
 Answer: $|a - b| = |b - a|$
- 166) A number is always at least as large as the negative of its absolute value and at most as large as its absolute value. 166) _____
 Answer: $-|a| \leq a \leq |a|$
- 167) The absolute value of the quotient of two numbers is equal to the quotient of the absolute values of the two numbers. 167) _____
 Answer: $\left| \frac{a}{b} \right| = \frac{|a|}{|b|}$
- 168) The absolute value of the product of two numbers is equal to the product of the absolute values of the numbers. 168) _____
 Answer: $|ab| = |a||b|$

Provide an appropriate response.

- 169) Give the bounds of summation and the index of summation for 169) _____

$$\sum_{i=2}^{13} (2i^2 - 3i)$$
 Answer: Index of Summation is i .
 Bounds of Summation are 2 and 13.
- 170) Give the bounds of summation and the index of summation for 170) _____

$$\sum_{k=4}^{21} (13k + 2)$$
 Answer: Index of Summation is k .

Bounds of Summation are 4 and 21.

171) Give the bounds of summation and the index of summation for

$$\sum_{j=7}^{10} (j^3 - j^2 + 6j - 1)$$

Answer: Index of Summation is k .

Bounds of Summation are 7 and 10.

171) _____

172) Give the bounds of summation and the index of summation for

$$\sum_{m=5}^{15} (9m^4 - 4m)$$

Answer: Index of Summation is m .

Bounds of Summation are 5 and 15.

172) _____

173)

$$\sum_{i=1}^5 13i$$

Evaluate

Answer: 195

173) _____

174)

$$\sum_{n=0}^4 (3n - 7)$$

Evaluate

Answer: -5

174) _____

175)

$$\sum_{k=10}^{13} (4k + 9)$$

Evaluate

Answer: 220

175) _____

176)

$$\sum_{p=1}^6 (6 - p)$$

Evaluate

Answer: 15

176) _____

177)

$$\sum_{i=1}^{10} 7$$

Evaluate

Answer: 70

177) _____

178)

$$\sum_{k=2}^5 2k^2$$

Evaluate

Answer: 108

178) _____

179) Express the sum in summation notation.

$$4 + 6 + 8 + 10 + 12 + 14 + 16$$

Answer: $\sum_{i=1}^8 2i$

179) _____

180) Express the sum in summation notation.

$$1 + 8 + 27 + 64 + 125$$

Answer: $\sum_{i=1}^6 i^3$

181) Express the sum in summation notation.
10 + 13 + 16 + 19 + 22 + 25 + 28 + 31

181) _____

Answer: $\sum_{i=1}^8 (3i + 7)$

182) Express the sum in summation notation.

182) _____

$1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5} + \frac{1}{6}$

Answer: $\sum_{i=1}^6 \frac{1}{i}$

183) Express the sum in summation notation.

183) _____

$7^3 + 7^4 + 7^5 + 7^6 + 7^7 + 7^8 + 7^9$

Answer: $\sum_{i=3}^9 7^i$

184) Express the sum in summation notation.

184) _____

$3 + \frac{3}{10} + \frac{3}{100} + \frac{3}{1,000} + \frac{3}{10,000} + \frac{3}{100,000} + \frac{3}{1,000,000}$

Answer: $\sum_{j=0}^6 \frac{3}{10^j}$

185) Express the sum in summation notation.

185) _____

1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 + 17 + ... + 37

Answer: $\sum_{j=0}^{18} (2j + 1)$

186) Express the sum in summation notation.

186) _____

7 + 11 + 15 + 19 + 23 + 27 + ... + 67

Answer: $\sum_{i=1}^{16} (4i + 3)$

187)

$\sum_{k=1}^{60} k$

187) _____

Evaluate

Answer: 1830

188)

$\sum_{i=1}^{30} i^2$

188) _____

Evaluate

Answer: 9455

189) $\sum_{j=1}^{15} j^3$ 189) _____
Evaluate
Answer: 14,400

190) $\sum_{k=1}^{100} (2k - 8)$ 190) _____
Evaluate
Answer: 9300

191) $\sum_{j=1}^{74} (6j + 2)$ 191) _____
Evaluate
Answer: 16,798

192) $\sum_{i=1}^{80} 25$ 192) _____
Evaluate
Answer: 2000

193) $\sum_{i=1}^{44} (i^2 + 4i)$ 193) _____
Evaluate
Answer: 33,330

194) $\sum_{k=1}^{120} (3k^2 - 6)$ 194) _____
Evaluate
Answer: 1,748,680

195) $\sum_{j=1}^{20} (j^2 + 5j + 7)$ 195) _____
Evaluate
Answer: 4060

196) $\sum_{k=1}^{40} (k^3 + 2k^2)$ 196) _____
Evaluate
Answer: 716,680

197) $\sum_{i=1}^{55} (2i^3 + 8i^2 - 6i + 7)$ 197) _____
Evaluate
Answer: 5,190,185

198) $\sum_{k=1}^n \frac{2k}{n+1}$ 198) _____
Evaluate
Answer: n

$$(2k+3) \sum_{k=1}^5$$

B)

$$(2k-3) \sum_{k=1}^5$$

C)

$$(2k-3) \sum_{k=0}^4$$

D)

$$(2k+3) \sum_{k=0}^4$$

Answer: B

Determine whether the given sequences are equal to each other.

209) $(k^2 - 9)$ and $(k + 3)(k - 3)$

209) _____

A) not equal

B) equal

Answer: B

Determine the indicated term of the given recursively defined sequence.

210) $a_1 = -3, a_2 = 3, a_{k+2} = a_{k+1} + 6; a_4$

210) _____

A) 15

B) 3

C) 21

D) 9

Answer: A

Write the first five terms of the arithmetic sequence with the given first term a and common difference d.

211) $a = 10; d = 1$

211) _____

A) 10, 10, 10,
10, 10B) 0, 10, 11,
12, 13C) 11, 12, 13,
14, 15D) 10, 11, 12,
13, 14

Answer: D

212) $a = 20; d = -4$

212) _____

A) 24, 19, 14, 9, 4

B) 20, 16, 12, 8, 4

C) -20, -16, -12, -8, -4

D) 0, 20, 16, 12, 8

Answer: B

213) $a = 8; d = -2$

213) _____

A) 6, 4, 2, 0,
-2B) 8, 6, 4, 2,
0C) 10, 8, 6, 4,
2D) 8, 6, 3, 2,
0

Answer: B

214) $a = -22; d = 2$

214) _____

A) -14, -16, -18, -20, -22

B) -18, -20, -22, -24, -26

C) -22, -20, -18, -16, -14

D) -18, -16, -14, -12, -10

Answer: C

Write the first five terms of the geometric sequence with the given first term a and common ratio r.

215) $a = 9; r = 3$

215) _____

A) 9, 27, 81, 243, 729

B) 9, 12, 15, 18, 21

C) 3, 27, 243, 2187, 19 683

D) 27, 81, 243, 729, 2187

Answer: A

216) $\frac{1}{4}$

216) _____

 $a = 1; r =$ A) $\frac{5}{4}, \frac{3}{2}, \frac{7}{4}, 2$ B) $\frac{1}{4}, \frac{1}{16}, \frac{1}{64}, \frac{1}{256}, \frac{1}{1024}$

C) 1, 4, 16, 64, 256

D) $\frac{1}{4}, \frac{1}{16}, \frac{1}{64}, \frac{1}{256}$

Answer: D

217) $a = 6; r = -5$

217) _____

A) 6, 30, 150, -750, 3750

C) 6, -30, 150, -750, 3750

Answer: C

B) -5, -30, 150, -750, 3750

D) 6, 1, -4, -9, -14

218) $a = -6; r = -5$

A) -6, -30, -150, 750, -3750

C) -5, 30, -150, 750, -3750

Answer: D

B) -6, -11, -16, -21, -26

D) -6, 30, -150, 750, -3750

218) _____

Find the indicated sum.

219) $\sum_{k=4}^7 2k$

A) 22

B) 44

C) 30

D) 14

Answer: B

219) _____

220) $\sum_{k=1}^5 (k+5)$

A) 40

B) 30

C) 16

D) 10

Answer: A

220) _____

221) $\sum_{k=1}^4 (4k-3)$

A) 13

B) 27

C) 17

D) 28

Answer: D

221) _____

222) $\sum_{k=1}^4 2^k$

A) 20

B) 18

C) 30

D) 14

Answer: C

222) _____

223) $\sum_{k=3}^5 (k^2-7)$

A) 3

B) 20

C) 29

D) -9

Answer: C

223) _____

224) $\sum_{k=2}^4 k(k+10)$

A) 119

B) 130

C) 48

D) 80

Answer: A

224) _____

Find the infinite sum, if possible.

225) $\sum_{k=1}^{\infty} \left(\frac{3}{8}\right)^{k-1}$

A) $\frac{3}{5}$

B) $\frac{3}{5}$

C) $\frac{8}{5}$

D) not possible

Answer: C

225) _____

Solve the problem.

226) To train for a race, Will begins by jogging 13 minutes one day per week. He increases his jogging time by 6 minutes each week. Write the general term of this arithmetic sequence, and find how many whole weeks it takes for him to reach a jogging time of one hour. 226) _____

A) $a_k = 6k + 13$; 9 weeks

B) $a_k = 6k + 7$; 8 weeks

C) $a_k = 6k + 7$; 9 weeks

D) $a_k = 6k + 13$; 8 weeks

Answer: C

227) The population of a town is increasing by 500 inhabitants each year. If its population at the beginning of 1990 was 26 153, what was its population at the beginning of 1999? 227) _____

A) 30 153 people

B) 470 394 people

C) 235 197 people

D) 30 653 people

Answer: D

228) A theater has 32 rows with 26 seats in the first row, 31 in the second row, 36 in the third row, and so forth. How many seats are in the theater? 228) _____

A) 3312 seats

B) 6784 seats

C) 6624 seats

D) 3392 seats

Answer: A

229) Keyana takes a job with a starting salary of \$35 000 for the first year with an annual increase of 4.5% beginning in the second year. What is Keyana's salary, to the nearest dollar, at the end of the sixth year? 229) _____

A) \$44 390

B) \$43 616

C) \$42 267

D) \$46 072

Answer: B

- 1) 8000
- 2) 130
- 3) 6
- 4) \$200,000
- 5) 15
- 6) 5
- 7) 660 colonials, 1980 ranches
- 8) 11,000
- 9) single rate, \$25; rate for two or more people, \$33
- 10) \$870
- 11) $q = 10$
- 12) 2
- 13) 6 and 7, or -7 and -6
- 14) -4 or 3
- 15) 1 m
- 16) 6%
- 17) 50 m by 200 m, or 100 m by 100 m
- 18) \$2.50
- 19) C
- 20) C
- 21) C
- 22) A
- 23) A
- 24) D
- 25) C
- 26) 4, 7, 16
- 27) 200×100
- 28) 6, 15
- 29) 12, 24
- 30) 200 units
- 31) Savings Account = 6600
Certificate of Deposit = 3400
- 32) 6, 6
- 33) 900, 2420
- 34) 2 cups wine and 8 cups beef stock
- 35) $\frac{2}{3}$ cup of sugar and $5\frac{1}{3}$ cups of fruit
- 36) 240 ml of acid and 300 ml of water
- 37) 27 kg aluminum and 36 kg copper
- 38) 380 sq ft
- 39) 5 ft wide
- 40) 1 m wide
- 41) 240 ft
- 42) 240 doors
- 43) \$13,200
- 44) Lost \$40
- 45) \$30
- 46) \$109.20
- 47) \$200
- 48) \$300
- 49) Approximately \$28.89

- 50) \$70,000 in the low-risk fund and \$20,000 in the medium-risk fund
- 51) \$100,000 in the safe investment and \$92,000 in the riskier investment
- 52) 12.5%
- 53) \$1250 in the checking account and \$8750 in the savings account.
- 54) 10%
- 55) 6%
- 56) 4%
- 57) 12%
- 58) \$1166.67 or \$1450
- 59) \$150 or \$1800
- 60) \$330 or \$620
- 61) \$40 or \$700
- 62) $x > -1$
- 63) $x \geq 2$
- 64) $\frac{1}{2}$
 $x <$
- 65) $\frac{11}{10}$
 $x \geq$
- 66) $x \geq 1$
- 67) $-\infty < x < \infty$
- 68) no solution
- 69) $t < 33$
- 70) $\frac{5}{24}$
 $x \leq$
- 71) $\frac{14}{3}$
 $x < -$
- 72) D
- 73) C
- 74) D
- 75) E
- 76) A
- 77) B
- 78) C
- 79) D
- 80) $x < 13$
- 81) $x \geq 5.167$
- 82) no solution
- 83) $-\infty < x < \infty$
- 84) $x \geq 2$
- 85) $a > -30$
- 86) 37°C
- 87) $R_2 < 20$ ohms
- 88) $0 \leq I \leq 24,000$; $0 \leq T \leq 3600$
- 89) $24,000 < I \leq 58,150$; $3600 < T \leq 13,162$
- 90) $58,150 < I \leq 121,300$; $13,162 < T \leq 32,738.50$
- 91) $I > 263,750$; $T > 84,020.50$
- 92) $x_4 \leq 150$
 $x_4 \geq 70$
 $x_4 \geq -60$
- 93)

$$70 \leq x_4 \leq 150$$

$$94) 0 \leq x_1 \leq 80; 0 \leq x_2 \leq 240; 130 \leq x_3 \leq 210$$

$$95) 2 \leq x \leq 4$$

$$96) \frac{1}{2}$$

$t > \frac{1}{2}$ hour

$$97) I > 11 \text{ amps}$$

$$98) 10,001$$

$$99) 1500$$

100) yearly sales under \$150,000

101) D

102) C

103) 5

104) $C \geq 37$

105) 146

106) at least 10,000 filters

107) \$13.75 per bag

108) \$4

109) 1800 players

110) 29th day

111) The rates are the same for a 5 day rental. Use company B when renting for more than 5 days.

112) 24 weekends

113) 4 days

114) up to \$1,040,000

115) up to \$2,600,000

116) up to \$24,000

117) up to \$8125

118) 90,000 copies

119) 27,000 copies

120) 10,000 copies

121) 16,000 copies

122) 6,251

123) 8

$$124) \frac{1}{9}$$

125) 5

126) 0

$$127) \sqrt{2} - 1$$

$$128) -6 < x < 6$$

$$129) \frac{5}{2}$$

-1,

$$130) x = -6, 14$$

$$131) \frac{9}{2}, \frac{15}{2}$$

$x = - ,$

$$132) -6 < x < 6$$

133) no solution

$$134) 0 \leq x \leq 12$$

$$135) \frac{1}{2} \leq x \leq \frac{7}{2}$$

$$136) x < 1, x > 4$$

$$137) -\infty < x < \infty$$

- 138) $x < -10, x > 2$
- 139) B
- 140) E
- 141) B
- 142) D
- 143) C
- 144) E
- 145) C
- 146) D
- 147) $x \leq -1$ or $x \geq 2$
- 148) $-16 < x < 14$
- 149) D
- 150) A
- 151) $x < -2$ or $x > 8$
- 152) $x = -4$ or $x = -10$
- 153) $x = 2$ or $x = -6$
- 154) $x = 2$ or $x = -11$
- 155) A distance cannot be negative, so there is no solution.
- 156) $-2 < x < 10$
- 157)
$$-7 \leq x \leq \frac{1}{3}$$
- 158) $-2 < x < 7$
- 159) $-2 \leq x \leq 5$
- 160) $x \leq -12$ or $x \geq -4$
- 161) $x \leq -3$ or $x \geq 9$
- 162)
$$x < -3$$
 or $x > -\frac{1}{3}$
- 163) $x < -1$ or $x > 3$
- 164) $|T_A - 6:00| \geq 6 \text{ min}$
- 165) $|a - b| = |b - a|$
- 166) $|a| \leq a \leq |a|$
- 167)
$$\left| \frac{a}{b} \right| = \frac{|a|}{|b|}$$
- 168) $|ab| = |a||b|$
- 169) Index of Summation is i .
Bounds of Summation are 2 and 13.
- 170) Index of Summation is k .
Bounds of Summation are 4 and 21.
- 171) Index of Summation is k .
Bounds of Summation are 7 and 10.
- 172) Index of Summation is m .
Bounds of Summation are 5 and 15.
- 173) 195
- 174) -5
- 175) 220
- 176) 15
- 177) 70
- 178) 108
- 179)
$$\sum_{i=1}^8 2i$$

$$180) \sum_{i=1}^6 i^3$$

$$181) \sum_{i=1}^8 (3i + 7)$$

$$182) \sum_{i=1}^6 \frac{1}{i}$$

$$183) \sum_{i=3}^9 7i$$

$$184) \sum_{j=0}^6 \frac{3}{10^j}$$

$$185) \sum_{j=0}^{18} (2j + 1)$$

$$186) \sum_{i=1}^{16} (4i + 3)$$

$$187) 1830$$

$$188) 9455$$

$$189) 14,400$$

$$190) 9300$$

$$191) 16,798$$

$$192) 2000$$

$$193) 33,330$$

$$194) 1,748,680$$

$$195) 4060$$

$$196) 716,680$$

$$197) 5,190,185$$

$$198) n$$

$$199) \frac{511}{72}$$

$$200) \frac{-11n^2 - 9n + 2}{6n}$$

$$201) 48,225$$

$$202) 1640$$

$$203) 31,995$$

$$204) 81,938$$

$$205) 41,930,150$$

$$206) A$$

$$207) D$$

$$208) B$$

$$209) B$$

$$210) A$$

$$211) D$$

$$212) B$$

$$213) B$$

$$214) C$$

$$215) A$$

$$216) D$$

- 217) C
- 218) D
- 219) B
- 220) A
- 221) D
- 222) C
- 223) C
- 224) A
- 225) C
- 226) C
- 227) D
- 228) A
- 229) B