15. According to Hooke's law, the length of a spring, S, varies directly as the force, F, applied on the spring. If a spring to which Hooke's law applies, a force of 18.6 lb stretches the spring by 1.27 in. Find k, the constant of proportionality.
A. 14.64 C. 4
B. 6.83 D. 8

16. A falling body strikes the ground with a velocity v which varies directly as the square root of the distance s it falls. If a body that falls 100 feet strikes the ground with a velocity of 80 ft per second, with what velocity will a ball dropped from the Washington Monument (approximately 550 ft high) strike the ground?
A. 15.7 ft C. 17.7ft
B. 16.7 ft D. 18.7ft

17. Harry is one-third as old as Ron and 8 years younger than Hermione. If Harry is 8 years old, what is the sum of their ages?
A. 40 C. 48
B. 45 D. 50

18. Bobbie has $1.54 in quarters, dimes, nickels, and pennies. He has twice as many dimes as quarters and three times as many nickels as dimes. The number of pennies is the same as the number of dimes. How many of each coin does he have?
A. q=2;d=4;n=12;p=4 C. q=4;d=4;n=3;p=4
B. q=6;d=3;n=2; p=3 D. q=5;d=4;n=2; p=4

19. The electrical resistance of a wire varies as its length and inversely as the square of the diameter. If a wire 100 m long and 1.25 mm in diameter has a resistance of 30 ohms, find the length of the wire of the same material whose resistance and diameter are 25 ohms and 0.75 mm, respectively?
A. 20 m C. 40 m
B. 30 m D. 50 m

20. Suppose that dolls sell for 7 dollars each and toy train sell for 18 dollars. A store sells only dolls and train sets, and the total amount received is 208 dollars. How many of toy trains were sold?
A. 22 C. 18
B. 3 D. 6

21. Given that z varies directly as x and inversely as y2. If x = 1 and y = 2, then z = 2. Find z when x = 3 and y = 4.
A. 1.5 C. 2.5
B. 3 D. 3.5

22. After the price of petroleum oil went up by 10%, a consumer reduced his oil consumption by the same percent. By what percent would his petroleum bill be changed?
A. 1% C. 10%
B. 11% D. 0.1%

23. Ana is 5 years older than Beth. In 5 years the product of their ages will be 1.5 times the product of their present ages. How old is Beth now?
A. 27 C. 25
B. 20 D.18

24. The sum of the ages of Peter and Paul is 21. Peter will be twice as old as Paul 3 years from now. What is the present age of Peter?
A. 8 C.18
B. 6 D.15

25. A multimillionaire left his entire estate to his wife, daughter, son and bodyguard. His daughter and son got half the total value of the estate sharing in the ratio of 3:2. His wife got twice value as much as the share of the son. If the bodyguard received half a million pesos, what is the total value of the estate?
A. 6.5 million C. 7 million
B. 5 million D. 6 million

26. A company sells 80 units and makes P80 profit. It sells 110 units and makes P140 profit. If the profit is a linear function of the number of units sold, what is the average profit per unit if the company sells 250 units?
A. P1.76 C. P1.66
B. P1.68 D. P1.86

27. The sum of the ages of Maria and Anna is 35. When Maria was two thirds her present age and Anna was 3/4 of her present age, the sum of their ages was 25. How old is Maria now?
A. 15 C. 10
B. 12 D. 18

28. Ten (10) yrs from now the sum of the ages of A and B is equal to 50. Six (6) yrs ago, the difference of their ages is equal to 6. How old is A and B?
A. A=18, B=12 C. A=16, B=24
B. A=10, B=22 D. A=19, B=29

29. John is twice as old as his friend Peter. Peter is 5 years older than Alice. In 5 years, John will be three times as old as Alice. How old is Peter now?
A. 5 years old C. 10 years old
B. 16 years old D. 24 years old

30. John's father is 5 times older than John and John is twice as old as his sister Alice. In two years time, the sum of their ages will be 58. How old is John now?
A. 15 years old C. 10 years old
B. 8 years old D. 24 years old

31. Mary's father is four times as old as Mary. Five years ago he was seven times as old. How old is Mary now?
A. 15 years old C. 10 years old
B. 8 years old D. 24 years old

32. A man is four times as old as his son. In 3 years, the father will be three times as old as his son. How old is the son?
A. 15 years old C. 6 years old
B. 8 years old D. 24 years old

33. Abigail is 8 years older than Cynthia. Twenty years ago Abigail was three times as old as Cynthia. How old is Abigail now?
A. 15 years old C. 26 years old
B. 32 years old D. 24 years old

34. Seymour is twice as old as Cassandra. If 16 is added to Cassandra's age and 16 is subtracted from Seymour's age, their ages will then be equal. How old is Seymour now?
A. 15 years old C. 26 years old
B. 64 years old D. 24 years old

35. The resistance of a wire varies directly with its length and inversely with its area. If a certain piece of wire 10m long and 0.10 cm in diameter has a resistance of 100 ohms, what will its resistance be if it is uniformly stretched so that its length becomes 12 m?
A. 120 Ω C. 144 Ω
B. 130 Ω D. 110 Ω

36. Candle A and candle B of equal length are lighted at the same time and burning until candle A is twice as long as candle B. Candler A is designed to fully burn in 8 hours while candle B for 4 hours. How long will they be lighted?
A. 3 hours and 30 minutes
B. 2 hours and 40 minutes
C. 3 hours
D. 2 hours

37. A customer bought some apples and some oranges, 12 pieces of fruit in total, and they cost him P132. If an apple cost P3 more than an orange, and if more apples than oranges were purchased, how many pieces of apples were bought?
A. 12 C. 8
B. 9 D. 4

38. An iron bar four meters long has a 300 pound weight hung on one end and a 200 pound weight hung at the opposite end. How far from the 300 pound weight should the fulcrum be located to balance the bar?
A. 2.5 meters C. 1.6 meters
B. 1.0 meters D. 2.0 meters

39. What is the equation form of the statement: The amount by which 100 exceeds four times a given number?
A. $4x(100)$ C. $100-4x$
B. $100+4x$ D. $4x-100$

40. For a particular experiment, you need 5 liters of 10% solution. You find 7% and 12% solution on the shelf. How much of the 7% solution you mix with the appropriate amount of the 12% solution to get 5 liters of 10% solution?
A.1.5 C.2
B.2.5 D.3

41. A farmer lays out the sum of 1770 crowns in purchasing horses and oxen. He pays 31 crowns for each horse and 21 crowns for each ox. How many oxen did the farmer buy?
A. 11 C. 51
B. 30 D. 40