1. A woman went shopping for some canned goods which were on sale. She bought three times as many cans of peaches and two times as many cans of tuna as cans of peaches. It she purchased a total of 24 cans, how many cans did he buy?

a. 5
b. 8
c. 4
d. 12

Ans: C

2. A man makes a business trip from his house to batangas in 2 hours. One hour later, he returns home in traffic at a rate of 20kph less that his going rate. If he is gone a total of 6 hours. How fast did he travel going back home?

a. 50
b. 60
c. 40
d. 30

Ans: C

3. A trapezoid has its 2 bases in meters in ratio of 4:5 with an latitude of 20 meters if the trapezoid has an area of 360 m^2 find the two bases.

a. 20 and 16
b. 8 and 10
c. 40 and 32
d. 12 and 5

Ans: A

4. Which of the following is the nth term of the set of number 8,4,0,-4?

a. 12-4n
b. 10-5n
c. 5-3n
d. 7-5n

Ans: A

5. A spring whose normal length is 10 inches has a modulus of 12 pounds per inch. How much work is done in stretching this spring from length of 12 inches to a total length of 15 inches?

a. 126 in-lb
b. 109 in-lb
c. 150 in-lb
d. 200 in-lb

Ans: A

6. A right circular tank of depth 12 feet and radius of 4 feet is half full of oil weighing 60 pound per cubic foot. Find the work done in pumping the oil to a height 6 feet above the tank.

a. 136 ft-tons
b. 159 ft-tons
c. 180 ft-tons
d. 250 ft-tons

Ans: A

7. Hooke's law states that within the limits of elasticity the displacement produced in a body is proportional to the force applied. That is F=kx, where k is called modulus. Thus., if the modulus of a spring is 20 pounds per inch, the work required to stretch or compress the spring a distance of 6 inches is

a. 30 in-lb
b. 32 in-lb
c. 35 in-lb
d. 55 in-lb

Ans. A.

8. What is the value of square root -7 x square root of -10?

a. Square root of 70
b. Negative square root of 70
c. Imaginary
d. Square root of 70 times i

Ans B

9. The points A(1,0) , B(9,2) and C(3,6) are vertices of triangle which of the following is an equation of one of medians?

a. X + 7y =23
b. 2x – 3y = 12
c. 4x + 4y =15
d. 2x – y =13

Ans. A

10. Find the area of the triangle which the line 4x – 6y +12 = 0 forms with the coordinate axes

a. 3
b. 5
c. 10
d. 7

Ans: A

11. A particles position (in inches) along the axis after 1 seconds of travel is given by the equation x = 24t^2 - 3t^3 + 10. What is the particle's average velocity, in in/sec during the first 3 seconds

a. 63
b. 45
c. 70
d. 47

Ans: B

12. Find the area of the region bounded by y = x^3 -3x^2 +2x +1 the axis, and vertical lines x = 0 and x=2

a. 4
b. 2
c. 10
d. 3

Ans: B

13. Find the rate of change of the area of a square with respect to its side when x=5

a. 63
b. 45
c. 10
d. 47

Ans: C

14. A spherical snow ball melting in such a way that its surface area decreases at rate of 1 cm^3/min. How fast is its radius shrinking when it is 3 com?

a. -1/2 π
b. -1/48 π
c. -1/20 π
d. -1/12 π

Ans: A

15. Two cities 270 km apart lie on the same meridian. Find their difference in latitude if the arth's radius is 3960 km.

a. 3/55 rad
b. 2/44 rad
c. 1/12 rad
d. 5/27 rad

Ans: A

16. Find the maximum area of a rectangle circumscribed about a fixed rectangle of length 6 cm and width of 4 cm.

a. 50
b. 24
c. 48
d. 100

Ans: A

17. The perimeter of an isosceles right triangle is 10.2426. Compute the area of the triangle in square units.

a. 4
b. 2
c. 4.5
d. 5.2

Ans: C

18. A piece of wire is shaped in enclose a rectangle with a length of 15 cm and whose area is 150 sq. cm. It is then reshaped to enclose a square. Find the area of the square in cm^2.

a. 156.25
b. 125.72
c. 453.72
d. 187.45

Ans: A

19. Find the area of the region bounded by the parabola x = y^2 and the line y=x-2

a. 8/2
b. 3/2
c. 7/2
d. 11/1

Ans: A

20. Five horses are in a race. A woman picks two of the horses in random, and bets one of them. Find the probability "p" that a person picked the winner

a. 1/10
b. 2/5
c. 3/10
d. 7/10

Ans: A

21. The probability that a hits the target is 1/3 and the probability that b hits target is 1/5 they both fire at the target. Find the probability that one of them hits the target.

a. 2/5
b. 3/5
c. 3/7
d. 9/10

Ans: A

22. What is (1+i) raised to the power 10?

a. 32i
b. 52i
c. I
d. Undefined

Ans: A

23. What is the maximum area of the rectangle whose base is on the x-axis and whose upper two vertices line on the parabola y = 12 – x^2

a. 32
b. 16
c. 54
d. 20

Ans: A

24. Find the equation of a line through point A(4,1) perpendicular to the line 2x -3y +4 = 0

a. A 3x + 2y =14
b. 2x +5y = 10
c. 5x -3y =10
d. 2x -10y =15

Ans: A

25. Find the particular solution of the differential dx/dt = x -1 ; x(0) =1

a. X(t) = 1
b. X(t) = 2
c. X(t) = 3
d. X(t) = 0

Ans: A

26. Fin the volume of the solid of revolution formed by rotating the region bounded by the parabola y= x^2 and the line y=0 and x = 2 about the x – axis

a. 2 π /5
b. π /5
c. 32 π /5
d. π /5

Ans: C

27. Find the slope of the curve defined by the equation yx^2 -4 = 0 at point (4.4)

a. -2
b. 5
c. -5
d. 2

Ans: A

28. A function y has the set of positive integers N as domain and for each n contained in N, y(n) =12 + cos (n x pi) + sin [(2n-1) pi/2]. What are the values of y corresponding to any odd positive integer?

a. 12
b. 1
c. 50
d. 3

Ans: A

29. Find the volume obtained if the region bounded by y = x^2 and y -2x = 0 is rotated about the x-axis

a. 64 π /15
b. 24 π /5
c. 34 π /15
d. π /15

Ans: A

30. Which of the following are the solutions to the following: y"' – 3y" + 3y' –y = 0

    I. e^x
    II. X(e^x)
    III. e^-x

a. I only
b. III only
c. I and II only
d. II only

Ans: C

31. Find all integers n such that (2n-6) is greater than 1 but less than 14

a. 4,5,6,7,8,9
b. 3,4,5,6,7,8
c. 1,2,3,4,5,6,7
d. 1,3,4,5,6,7,8,9

Ans: A

32. Write the equation of the line with x intercept a = 4/5 and y – intercept b =1/2

a. 5x + 8y =4
b. 5x – 8y = 4
c. 3x + 8y = 4
d. X + 2y =7

Ans: A

33. Find all the values of m for which ; y = e(to power mx) is a solution of 6y" – y' – y =0 on (-infinity , + infinity)

a. m = -1/2, 2/3
b. m = -1,2,3
c. m= -3,-1/3
d. m= -1/3, ½

Ans: D

34. if the columns (or rows) of determinant are identical, the value of the determinant is

a. negative
b. positive
c. zero
d. undefined

Ans: C

35. what is I (raised to power 96)

a. m = -1/2, 2/3
b. m= -1,2,3
c. m = -3,1/3
d. m = -1/3, ½

Ans: D

36. The probability that a married man watches a certain television show is 0.4 and the probability that a married woman watches the shoe is 0.5. The probability that a man watches the show given that his wife does is 0.70 . Find the probability that at least 1 person of married couple will watch the shoe

a. 0.35
b. 0.65
c. 0.75
d. 0.55

Ans: D

37. A coin is biased so that a head is twice as likely to occur as a tail. If the coin is tossed 3 times, what is the probability of getting 2 tails and 1 head?

a. 2/9
b. 3/7
c. 2/5
d. 1/5

Ans: A

38. The probability that a doctor correctly diagnosis a particular illness is 0.70. Given that the doctor makes and incorrect and incorrect diagnosis, the probability that the doctor makes an incorrect diagnosis and the patient sues?

a. 0.27
b. 0.17
c. 0.32
d. 0.70

Ans: A

39. In the curve y = 3 cos (1/2) x, what is the amplitude and period ?
a. 3, 3 π /2
b. 3, 4 π
c. 3, 2 π
d. 3, π /2

Ans: B

40. A Man invested Php 50,000. Part of it he put in an oil stock from which he hoped to receive a 20% return per year. The rest he invested in a bank stock which was paying 6% per year. If he received Php 400 more the first year from the bank stock than from the oil stock, how much did the invest in the oil stock?
a. 10,000
b. 5,000
c. 2,000
d. 30,000

Ans: A

41. In the non-generate conic 3x^2 + 6xy + 5y^2 – x +y = 0
a. Parabola
b. Ellipse
c. Hyperbola
d. Circle

Ans: B

42. A baseball diamond is a square ……..batter hits the ball and runs to first base at the rate ……..how fast is his distance from the second base changing when he runs 50 fr?
a. $80/\sqrt{90}$
b. $40/\sqrt{97}$
c. 20/3
d. 15/7

Ans: A

43. The dimensions of a rectangle are continuously changing. The width increases at the rate of 3 in/2 while the length decreases at the rate of 2 in/s. At one instant the rectangle is a 20-in square. How fast is tis area changing 3 seconds later?
a. -16
b. -32
c. 16
d. 32

Ans: A

44. A through filled with water is 2m long and has a cross section in the shape of an isosceles trapezoid 30 cm wide at the bottom, 60 cm wide at the top, and height of 50 cm. If the through leaks water at the rate of 2000 cm^ 3 / min, how fast is the water level falling when the water is 20 cm deep?
a. -5/21
b. -3/23
c. -15/32
d. -2/3

Ans: A

45. The height (in feet) at any time t (in seconds) of a projectile thrown vertically is : h(t) = -16t^2 + 256t. What is the velocity when it reached the ground?
a. 16s
b. 18s
c. 12s
d. 10s

Ans: A

46. The height (in feet) at any time t (in seconds) of projectile thrown vertically is : h(t) = -16t^2 + 256t. What is the velocity when it reached the ground?
a. -256
b. 312
c. 352
d. 0

Ans: A

47. The charge in coulombs that passes through a wire after 1 seconds is given by the function Q(t) = t^3 - 2t^2 + 5t +2 determine the average current during the first two seconds

a. 5A
b. 3A
c. 2A
d. 10A

Ans: A

48. Water is being pumped into the conical tank at the rate of 100 ft3/min. the height of the tank is 20ft and its radius is 5ft. how fast the water level rising when the water height is 10 ft?

a. 16/π
b. 12/π
c. 2π
d. 10π

Ans: A

49. Change the equation y=x from rectangular to polar coordinates

a. π/4
b. π/3
c. π
d. π/2

Ans. A

50. A runner and his trainer are standing together on a circular track of radius 100 meters. When the trainer gives a signal, the runner starts to run around the track at a speed of 10 m/s. how fast is the distance between the runner and the trainer increasing when the runner has run ¼ of the way around the track?

a. 5√2
b. 3√2
c. 2√2
d. 7√2

Ans: A

51. Find the point on the graph y = (x squared) + 1 that is closest to the point (3, 1).

A. (1, 3)

B. (2, 1)

C. (1, 2)

D. (1, 4)

Ans. C

52. What is the polar equation of the circle with the center at pole containing the given point (1,1), rectangular coordinates.

A. r = 1

B. r = ½

C. r= sq rt of 2

D. r =2

Ans. C

53. An elevator carries two passengers from the first to the second floor, where an additional passengers enters Two people get out at the third floor and the remaining person rides to the fourth floor Find the work in ft-lb required to lift the passengers if each passenger weighs 150 ft-lb and the floors are 12 ft apart.

A. 12800

B 20800

C. 10800

D. 20800

Ans. C

54. An agent has 8 master keys to open several homes. Only 1 master key will open any house. If 40% of that the agent can get into a specific home if the agent selects 3 master keys at random before leaving the office?

A. 1/8

B. 1/4

C. 5/8

D. 1/4

Ans. C

55. Evaluate the following:[(cos 15 deg + I sin 15) to the 3rd power]

A. (1/3 + (sq. rt of 2) i)

B. (sq rt. of 2) /2 + (sq. rt of 2) / 2i

C. (sq. rt of 2) + (sq. rt of 2) + (sq. rt of 2) i

D. (sq. rt of 2) + i

Ans. B

56. A box contains 2 white socks and 2 blue socks. Two socks are drawn at random. Find the probability p they are a match (same color).

A. 1/3

B. 1/8

C. 1/4

D. 1/2

Ans. C

57. A long rectangular sheet of metal, 12 inches wide, is to be made into a gutter by turning up 2 sides so that they are perpendicular to the sheet. How many inches should be turned up to give the gutter its greatest capacity?

A. 3

B. 1/8

C. 1/4

D. 1/2

Ans. A

58. Revolve the area bounded by a pentagon with vertices (1,0), (2,2), (0,4), (-2,2), (-1,0) about the axis and find volume generated.

A. 104 π / 3

B. 124 π / 3

C. 114 π

D. 135 π

Ans. A

59. Two cars headed to a town. One is 50 km ahead of the other on the same road. The one in front is traveling 60 kph while the second car traveling 70 kph. How many kms did the second car travel before overtaking the first car?

A. 350 km

B. 254 km

C. 312 km

D. 300 km

Ans. A

60. The proportions of blood phenotypes A, B, AB and O in the population of all Caucasians in the US are reported as 0.41, 0.10, 0.04 and 0.45, respectively. If the Caucasian is chosen randomly from the population, what is the probability that he or she will have either type A or type AB blood?

A. 0.45

B. 0.35

C. 0.15

D 0.10

Ans. A

61. Find the limit of [(-1 to the nth power) (2 to the –nth power)] as n approaches infinity

A. 0

B. 1

C. infinity

D. undefined

Ans. A

62. In the curve y = tan 3x, what is its period?

A. π/3

B. 1

C. infinity

D. undefined

Ans. A

63. What number will be greater its square by the minimum amount?

A. π/3

B 1/3

C. infinity

D. undefined

Ans. B

64. Find the centroid along the y –axis of the solid formed by revolving about the y – axis the first quadrant area bounded by the parabola (y squared) = 4ax and the lines y = 0 and x =a

A. 5a/6

B. 3a/5

C. 2a/7

D. 3a/5

Ans. A

65. Find the equation of the bisector of the pair of acute angles formed by the lines 4x + 2y = 9 and 2x – y = 8

A. 8x – 25 = 0

B. 4x – 13 = 0

C. 7x – 17 = 0

D. 4x – 15 = 0

Ans. A

66. A kite is flying 100 feet above the ground, moving in a strictly horizontal direction at a rate of 10 ft/s. How fast is the angle between the string and the horizontal changing when there is 300 ft of string out?

A. -1/90

B. -1/70

C. -3/20

D. -5/70

Ans. A

67. Find the rectangular coordinates of [3 (square root of 2), 45 deg]

A. (3,3)

B. (2,2)

C. (1,1)

D. All of these

Ans. A

68. Find the area bounded by the parabola $y = 5 + 2x - x^2$ and the chord joining (-2, -3) and (3,2)

A. 20.833

B. 30.345

C. 17.432

D. 12.475

Ans. A

69. What is the polar equation of the circle with the given radius a = 3/2 and with center in polar coordinates (3/2, π)?

A. (0,3)

B. (1,5)

C. (2,5)

D. (0,1)

Ans. A

70. Find the pole of the polar line $2x - y = 0$ with respect to the conic whose equation is $x^3 + 8xy - 2y^2 - 12x + 6y - 9 = 0$

A. (0,3)

B. (1,5)

C. (2,5)

D. (0,1)

Ans. A

71. Find how far an airplane will move in landing, if in t seconds after touching the ground its speed in feet per second is given by the equation V = 180 -18t.

A. 900 ft

B. 800 ft

C. 200 ft

D. 150 ft

Ans. A

72.

73.

74 The value of a machine after t years is $V(t) = 100t^2 - 3000t + 20{,}000$ in pesos. At what rate does the machine depreciate after 5 years?

A. -2000

B -3000

C. 1500

D. 2350

Ans. A

75. The rate at which a tablet of Vitamin C begins to dissolve depends on the surface area of the tablet. One brand of tablet is 2 cm long and is in the shape of cylinder with the hemispheres of diameter 0.5 cm attached to both ends. A second brand of tablet is to be manufactured in the shape of right circular cylinder of altitude 0.5cm. Find the volume of the tablet in cubic cm.

A. π/8

B. π/2

C. π/3

D. π/ 16

Ans. A.

76. Find the rate of change of the volume of the sphere with respect to its radius is 5.

A. 100 π

B. 200 π

C. 150 π

D. 250 π

Ans. A

77. The dimension of a rectangle are continuously changing. The width increases at the rate of 3 in/s while the length decreases ar the rate of 2 in/s. At one instant, the rectangle is a 20 in square. How fast is its area changing 3 seconds later?

A. -16

B. -24

C. -32

D. -45

Ans. A

78. A tank is in the form of a frustum of a tight circular cone is filled with oil weighing 50 pounds per cubic foot. If the height of the tank is 10 feet, base radius is 6 ft and the top radius is 4 ft, find the work required in ft-tons to pump oil to a height 10 feet above the tank.

A. -312 ft-tons

B. -342 ft-tons

C. -325 ft-tons

D. -435 ft-tons

Ans. A

79. Find the limit of { [(x cubed) – 2x +5] / [2(x cubed) -7]} as approaches infinity

A. 1/2

B. 1/3

C. 1/4

D. 1/7

Ans. A

80. In the ellipse (x squared) + 3 (y squared) + 2x – 6y = 0, find the length of the diameter which has a slope of 1.

A. 2 sq. rt of 2

B. 3 sq. rt of 3

C. 3 sq. rt of 7

D. 5 sq. rt of 3

Ans. A

81. A stock certificate of a mining company guarantees a dividend of P120 at the end of each year for 12 years and a final additional payment at the end of 10 years of P1200. If the money is 12% effective, what is the certificate worth now?

A. 951.39

B. 857.54

C. 1095.54

D. 789.45

Ans A.

82. Find the value of x for the given function csc 2x is continuous.

A. 1/3 πx

B. 1/3 πx

C. 1/4 πx

D. 1/7 πx

Ans A.

83. Find the radius of curvature for the curve y = sinx at the point (π/2, 1)

A. 1

B. 2

C. 3

D. 4

Ans. A

84. Find the equation of the set of all points equally distant from y –axis and (4,0)

A. $y^2 – 8x +16 = 0$

B. $x^2 – 8x +16 = 0$

C. $y^2 – 10x +2 = 0$

D. $x^2 – 5y – 10 = 0$

Ans. A

85. Find the equation of all points equally which are twice as far from (4,4) and (1,1).

A. $x^2 + y^2 = 8$

B. $2x^2 + 3y^2 = 10$

C. $x^2 + y^2 = 100$

D. $xy = 4$

Ans. A

86. Find the maximum area of a rectangle inscribed in a semi-circle of radius 5 inches if its base lies along the diameter of the semi-circle?

A. 25

B. 5

C. 100

D. 35

Ans. A

87. Find the dimensions of the right circular cylinder of maximum volume that can be inscribed in a right circular cone whose radius is 3 inches and whose height is 10 inches?

A. $40\pi / 3$

B. $32\pi / 3$

C. $15\pi / 3$

D. $17\pi / 3$

Ans. A

88. A television camera is located 5000 ft from the base of a rocket launching pad. The camera is designed to follow vertical path of the rocket. If the rocket's speed is 500 ft/s when it has risen 2000 ft, how fast is the camera,s angle of elevation changing at this instant?

A. 4.94 deg/s

B. 5.48 deg/s

C. 1.25 deg/s

D. 2.35 deg/s

Ans. A

89. A painting of height 3 ft hangs on a wall with the bottom of the painting 6 ft above the floor. How far from the wall should Lindsay, whose eyes are 5 ft from the floor stand in order to get the best view of the painting. (The best view occurs when the angle of vision from the bottom to the top of the painting is maximize)?

A. 2

B. 3

C. 5

D 1.7

Ans. A

90. A man at point A on the shores of a circular take of radius 1 mile wants to reach point B on the shore diametrically opposite A. If he can row a boat 3 mi/hr and jog 6 mi/hr, at what angle θ with the diameter should he row in order to reach B in the shortest possible time?

A. 45.12
B. 35.12
C. 73.23
D. 23.45

Ans. A

91. How much money should a man invest in a bank account paying 8 percent annual interest compounded continuously if he wants to use the money to buy 20,000 equipment in 4yrs.?

A. 14,552.98

B. 15,346.76

C. 12,457.45

D. 11,237.45

Ans. A

92. According to Newton,s Law of cooling the temperature of n object changes at a rate proportional to the difference in temperature between the object and the outside medium. If an object whose temperature is 70F is placed in a medium whose temperature is 20^0 and 40^0 after 3 minutes, what will its temperature be after 6 minutes?

A. 28 deg

B. 38 deg

C. 26 deg

D. 20 deg

Ans A.

93. A public health report states that t weeks after the outbreak of a new strain of flu, the number of people in thousands who wi he number of people, in thousands, who will contract the disease is Q(t)=10/1+100e^-1.5t. At what rate did people contract the disease after two weeks?

A. 2089

B. 3125

C. 2312

D. 2908

Ans. A

94. Find the volume obtained if the region bounded by y=x^2 and y=2X is rotated about the X-axis

A. 64rad/15

B. 32rad/15

C. 16rad/15

D. 12rad/15

Ans. A

95. A police car is 20 ft away from a long straight wall. Its beacon , ratating 1 revolution per second, shines a beam of light on the wall. How fast is the beam moving when it is closest to the police car?

A. 40rad ft/s

B. 20rad ft/s

C. 30rad ft/s

D. 15rad ft/s

Ans. A

96. A rectangle os to be inscribed in the ellipse x^2/200+y^2/50=1.

A. 200

B. 100

C. 300

D. 150

Ans. A

97. An open box is to be constructed from a 12x12 inch piece of cardboard by cutting away squares of equal size from the four corners and folding up the sides. Determine the size of the cut out that maximizes the volume of the box?

A. 128

B. 231

C. 350

D. 274

Ans. A

98. A factory operator bought a diesel generator set P 10,000 and agreed to pay the dealer uniform sum at the end of each year for 5 yrs at 8% compounded semi-annually, that the final payment will cancel the debt for principal and interest. What is the annual payment?

A. 12yrs (2504.50 – correct answer)

B.10yrs

C. 15yrs

D. 17yrs

Ans. A

99. An electric motor has a cash price of P 8000. It can also be bought on installment basis with down payment of P2000 and with periodic equal payments at the end of every 6 months for 5 yrs if interest is fixed at 8% compounded semi-annually, how much is each periodic payment?

A. 122.56

B. 439.56

C. 739.75

D. 874.32

Ans. C

100. A ski resort installs two new ski lift at a cost of P 1, 800, 000. The resort expects annul gross revenue to increase P 500, 000 while it incurs an annual expense of P 50, 000 for lift operations and maintenance. What is the pay back period?

A. 4 years

B. 3 years

C. 2 years

D. 7 years

Ans. A