STUDENT COPY

IBA

Name :	Batch:

MATH LECTURE - 09

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PART I: CLASS PRACTICE

GROUP 1: FINDING DIFFERENT RATIOS

1. The area of a square is equal to the area of a circle. What is the ratio of the square's side to the circle's radius?

   a. 1: 1 b. $\sqrt{\pi}$: 1 c. π: 1 d. 1:$\sqrt{2}$ e. 1 :π

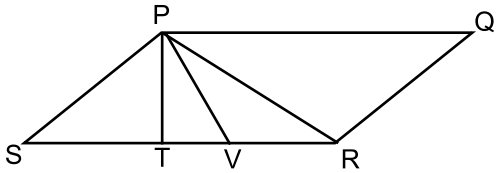
2. The ratio of the area of a circle to the radius of the circle is:

   a. πr b. 2π c. π^2 d. $\frac{r}{2}$ e. Cannot be determined

3. In the figure below, PQRS is a parallelogram, and ST = TV = VR. What is the ratio of the area of triangle SPT to the area of the parallelogram?

   a. $\frac{1}{6}$ b. $\frac{1}{5}$ c. $\frac{2}{7}$

   d. $\frac{1}{3}$ e. Cannot be determined



4. What is the ratio of the diagonal of a square to the hypotenuse of the isosceles right triangle having the same area?

   a. 1:2 b. 1:$\sqrt{2}$ c. 1:1 d. $\sqrt{2}$:1 e. 2:1

5. In the figure below, AB = BC and angle BEA is a right angle. If the length of DE is four times the length of BE, then what is the ratio of the area of ΔACD to the area of ΔABC?

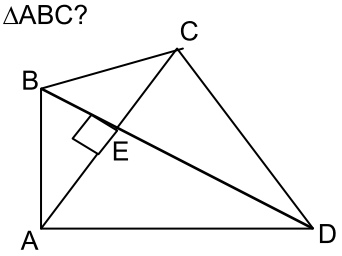
   a. 1:4

   b. 1:2

   c. 2:1

   d. 4:1

   e. Cannot be determined



GROUP 3: FINDING AREA FROM COMPOSITE FIGURES

6. In the diagram shown, ACDF is a rectangle, and GBHE is a circle. If CD=4 inches, and AC=6 inches, what is the area of the shaded portion?

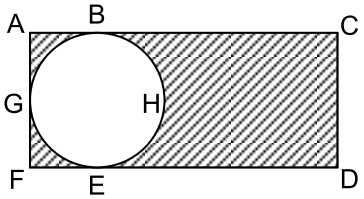
   a. 16 – 4π square inches

   b. 24 – 4π square inches

   c. 24 – 16π square inches

   d. 16 – 2π square inches

   e. 24 – 2π square inches



7. If, in this diagram, A represents a square with a side of 4″, and B, C, D and E are semicircles, what is the area of the entire figure?

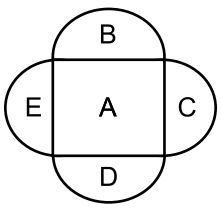
   a. 16 + 4π square inches

   b. 16 + 8π square inches

   c. 16 + 16π square inches

   d. 16 + 32π square inches

   e. 16 – 64π square inches



8. In the figure beside, AB is a diameter of the circle with center O and ABCD is a square. What is the area of the shaded region in terms of the radius of the circle, r?

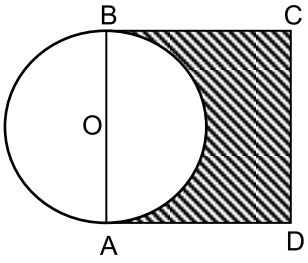
a. $\pi (r^2 - 4)$

b. $\pi (4 - \pi)$

c. $r^2 (\pi - 2)$

d. $r^2 (2 - \frac{\pi}{2})$

e. $r^2 (4 - \frac{\pi}{2})$



9. The length of one side of the square in the picture below is 8. All the four circles are inscribed within the square and are of equal radii. What is the area of the shaded region?

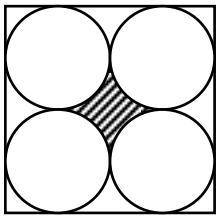
a. 16π

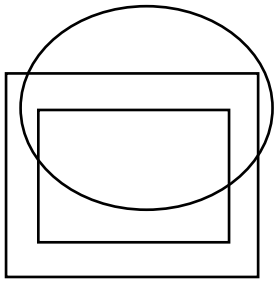
b. $64 - 16\pi$

c. $16 - 4\pi$

d. $64 - 32\pi$

e. $64 - 26\pi$





10. The length of one side of the smaller square is 5. What is the area of the larger square?

a. 100 b. 150 c. 25 d. 50 e. 75

GROUP 6: COORDINATE GEOMETRY

11. If the coordinates of point P are (0, 8), and the coordinates of point Q are (4, 2), which of the following points represents the midpoint of PQ?

a. (0, 2) b. (2, 4) c. (2, 5) d. (4, 8) e. (4, 10)

12. What is the area, in square units, of a triangle whose vertices are (–5, 1), (–5, 4), (2, 4)?

a. 10.5 b. 12.5 c. 15.0 d. 20.0 e. 21.0

13. Find the distance between the point (7, 1) and the point (– 5, – 4).

a. $\sqrt{13}$ b. 5 c. 12 d. 13 e. None of these

14. In the figure below, the slope of line l is 2. What is the value of B?

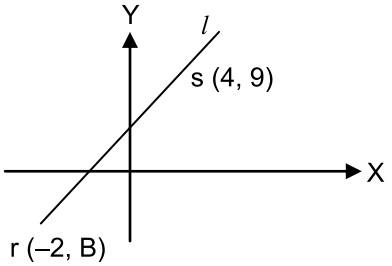
a. –2

b. 1

c. 2

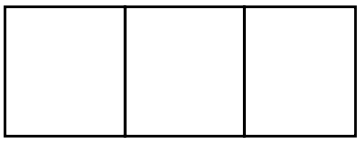
d. – 3

e. None of these



GROUP 5: PROBLEMS COMBINING / SPLITTING GEOMETRIC FIGURES

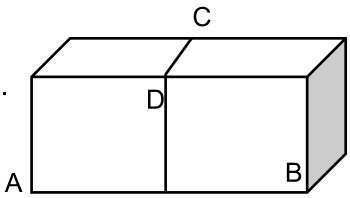
15. The perimeter of a square is 20 cm. If such 3 squares make a rectangle as shown in the picture beside, what will be the perimeter of the resultant rectangle?



a) 15 cm b) 20 cm c) 30 cm

d) 40 cm e) 45 cm

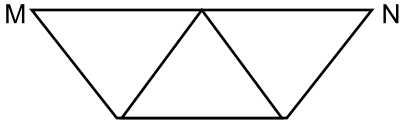
16. The picture beside is a rectangular solid whose volume is 250 cubic feet. However, if it is cut along CD, it makes two cubes of equal volume. What is the length of AB?



a. 5 feet b. 8 feet c. 10 feet

d. 25 feet e. Cannot be determined

17. Three equilateral triangles form a trapezoid in the figure beside. If MN = 2 cm, what is the area of the trapezoid?



a) 6 cm^2 b) $\frac{3\sqrt{3}}{4}$ cm^2 c) $\frac{9\sqrt{3}}{4}$ cm^2

d) $3\sqrt{3}$ cm^2 e) Cannot be determined

GROUP 6: FINDING SPECIFIC CHANGES

18. If the diameter of a circle doubles, the circumference of the larger circle is how many times the circumference of the original circle?

a. 2 b. 4 c. 6 d. 8 e. None of these

19. If the radius of a circle is decreased by 50%, what will be the percent decrease in the area of the circle?

a. 50% b. 25% c. 75% d. 100% e. None of these

20. If the radius is doubled and height is divided by 3, what will be the ratio of the new volume to the original volume of a cylinder?

a. 4:3 b. 3:4 c. 2:3 d. 3:2 e. None of these

21. Sajid has two containers: the first is a rectangular solid measuring 3 inches by 4 inches by 10 inches; the second is a cylinder having a base with a radius of 2 inches, and a height of 10 inches. If the first container is filled with water and then this water is poured into the second container, which of the following occurs:

a. There is room for more water in the second container.

b. The second container is completely filled, without overflowing.

c. The second container overflows by less than 1 cubic inch.

d. The second container overflows by less than 2 but not less than 1 cubic inches.

e. The second container overflows by 2 or more cubic inches.

GROUP 7: FINDING VARIOUS MEASUREMENT

22. How many circles, each with a 4-inch radius, can be cut from a rectangular sheet of paper, measuring 16 inches × 24 inches?

a. 6 b. 7 c. 8 d. 12 e. 24

23. Mondrita walks 4 kms, turns left and walks 3 kms and again turns left and walks 3 kms. How far in kilometers is she now from the starting point?

a. 3 b. $\sqrt{3}$ c. $\sqrt{10}$ d. $\sqrt{12}$ e. $\sqrt{15}$

24. The measurements of a rectangle are 12 feet by 16 feet. What is the area of the smallest circle that can cover this rectangle entirely so that no part of the rectangle is outside the circle?

a. 192 square feet b. 384 square feet c. 100π square feet

d. 128π square feet e. 400π square feet

25. Irfan wishes to cover his floor with tiles, each one measuring $\frac{3}{4}$ inch by 2 inches. If his room is a rectangle, measuring 12 feet by 18 feet, how many such tiles will he need?

a. 144 b. 1,152 c. 1,728 d. 9,126 e. 20,736

PART II: TAKE HOME ASSIGNMENT

1. In a square, what is the ratio of the perimeter to the length of its diagonal?

a. $\frac{\sqrt{2}}{2}$ b. $\sqrt{2}$ c. 2 d. $2\sqrt{2}$ e. 4

2. In the figure below, point A is the center of the larger circle. What is the ratio of the area of the large circle to the area of the small circle?

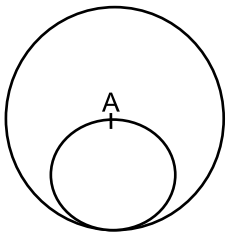
a. 2.00

b. 2.25

c. 3.00

d. 3.25

e. 4.00



3. If a rectangle has corners at (–2, 2), (–2, 6), and (–4, 6), what is the location of the fourth corner?

a. (0, 0) b. (2, 4) c. (–2, –2) d. (4, 2) e. (–4, 2)

4. What is the area, in sq. units, of a quadrilateral whose vertices are (5, 3), (6, – 4), (–3, – 2), (– 4, 7)?

a. 45 b. 58 c. 69 d. 138 e. None of these

5. Find the distance between the point (–7, 4) and the point (1, – 2).

a. 8 b. 10 c. 12 d. 15 e. None of these

6. The ratio of the radii of two circles is 1:3, which of the following represents the ratio of the areas of the circles?

a. 1:4 b. 1:16 c. 1:8 d. 1:12 e. 1:9

7. The ratio of the area of an equilateral triangle to its perimeter is:

a. 3:4 b. $\frac{\sqrt{3}}{12}a$ c. $\sqrt{3}$:4 d. 4:$\sqrt{3}$ e. Cannot be determined

8. The ratio of the area of a square to the square of its diagonal is which of the following?

a. 2:1 b. $\sqrt{2}$:1 c. 1:1 d. 1:$\sqrt{2}$ e. 1:2

9. If ABCD is a square, with side AB = 4 inches, and AEB and CED are semicircles, what is the area of the shaded portion in the diagram below?

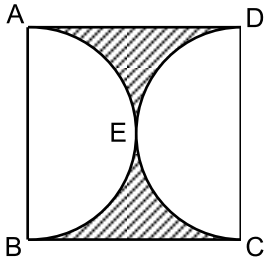
a. $8 - \pi$ square inches

b. $16 - 4\pi$ square inches

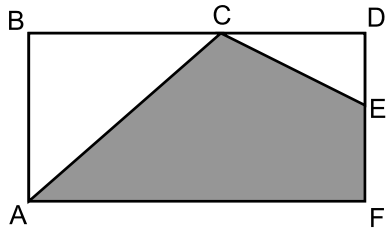
c. $16 - \pi$ square inches

d. $16 - 2\pi$ square inches

e. $8 - 4\pi$ square inches

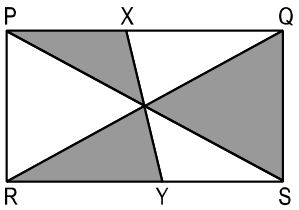


10. In rectangle ABDF below, C and E are midpoints of sides BD and DF respectively. What fraction of the area of the rectangle is shaded?



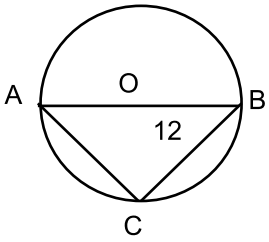
a. $\frac{5}{8}$ b. $\frac{1}{2}$ c. $\frac{1}{3}$ d. $\frac{3}{8}$ e. $\frac{8}{5}$

11. In the following figure, what percent of the area of rectangle PQRS is shaded? Here, PS & QR are diagonals and PX = SY.



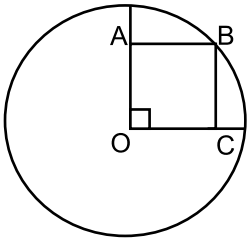
a. 20
b. 30
c. 33.33
d. 35
e. 50

12. In the picture above, if AB is the diameter of triangle ABC, CB =12, and the radius = 6.5, which of the following is the area of the triangle ABC?



a) 24 b) 28 c) 30
d) 36 e) 42

13. In the figure beside, O is the center of the circle and B is a point on the circle. In rectangle OABC, if OA = 4 and OC = 5, what is the area of the circle?

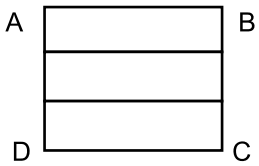


a. 9π
b. 64π
c. 25π
d. 16π
e. 41π

14. Which of the following has the largest perimeter?
a. A square with a diagonal of $5\sqrt{2}$ inches
b. A 3:4:5 -triangle with a hypotenuse of 15 inches
c. An octagon, each of whose side is 4 inches
d. A right isosceles triangle with an area of 72 square inches
e. A regular hexagon with a side of 5 inches

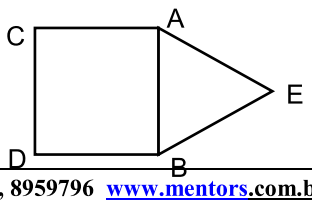
15. Which of the following has the smallest volume?
a. A sphere with a radius of 3 cm
b. A cylinder with a radius of 2 cm and a height of 10 cm
c. A cube with a side of 5 cm
d. A rectangular solid with a dimension of 13 cm x 5 cm x 2 cm
e. All of them have the same volume

16. In the picture beside, ABCD is a square. Inside the square, there are three rectangles of equal area. If the area of the square ABCD is 81 sq. meter, What is the perimeter of each of the rectangles?



a) 9 m b) 12 m c) 24 m
d) 30 m e) 36 m

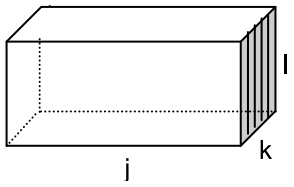
17. In the figure beside, ABCD is a square and ΔABE is an equilateral triangle. If AB= 4 cm, what is the area of the entire figure?



a) $16 + 8\sqrt{3}$ cm^2 b) $16 + 4\sqrt{3}$ cm^2 c) 28 cm^2

d) $16 + \sqrt{3}\ cm^2$ e) None of these

18. In the figure below, the area of the base of the rectangular box is 21 and the area of the shaded face is 30. If each of the dimensions j, k, l is an integer greater than 1, what is the volume of the rectangular box?



a. 630 b. 210 c. 420

d. $\frac{70}{3}$ e. $210\sqrt{3}$

19. If the radius of a circle is tripled, the area of the larger circle is how many times the area of the original circle?

a. 3 b. 6 c. 8 d. 27 e. None of these

20. If the radius of a sphere is doubled, what is the ratio of the new volume to the old volume of the sphere?

a. 2:1 b. 4:1 c. 1:8 d. 8:1 e. 9:1

21. If the area of the base of a rectangular solid is tripled, what is the percent increase in its volume?

a. 200% b. 300% c. 600% d. 800% e. None of these

22. The inside of a trough is shaped like a rectangular solid, 25 feet long, 6 inches wide, and filled with water to a depth of 35 inches. If we wish to raise the depth of the water to 38 inches, how much water must be let into the tank?

a. $\frac{25}{96}$ cubic feet b. $\frac{25}{8}$ cubic feet c. $\frac{75}{2}$ cubic feet d. 225 cubic feet e. 450 cubic feet

23. What is the approximate area that remains after a circle 3.5″ in diameter is cut from a square piece of cloth with a side of 8″?

a. 25.5 square inches b. 54.4 square inches c. 56.8 square inches

d. 142.1 square inches e. 284.2 square inches

24. Tarique walks 7 kms, turns left and walks 5 kms, and again turns left and walks 4 kms. How far in kilometers is he now from the starting point?

a. $\sqrt{16}$ b. $\sqrt{8}$ c. $\sqrt{7}$ d. $\sqrt{4}$ e. $\sqrt{34}$

25. Tiles of linoleum, measuring 8 inches x 8 inches, cost 0.09 taka a piece. At this rate, what will it cost a man to cover a floor with such tiles, if his floor measures 10 feet by 16 feet?

a. Tk. 22.50 b. Tk. 25.00 c. Tk. 28.00 d. Tk. 32.40 e. Tk. 36.00

26. A rectangle has a length of 8 feet and a width of 6 feet. What is the area of the largest circle that can be placed inside this rectangle?

a. 3π square feet b. 9π square feet c. 25π square feet

d. 36π square feet e. 100π square feet

27. Line ℓ passes through the origin and the point (3,–5). Which of the following is the slope of line ℓ?

a. $\frac{4}{5}$ b. $\frac{5}{3}$ c. $\frac{3}{4}$ d. $-\frac{3}{5}$ e. $-\frac{5}{3}$

Name……

Review Test on Lecture 8

10 Marks, 10 Minutes

Batch……

1. How many degrees are there between two adjacent sides of a hexagon?

a. 108° b. 120° c. 129° d. 135° e. Cannot be determined

2. What is the area of a semicircle that has half the radius of a circle having a perimeter of 8π?

a. π b. 2π c. 4π d. 8π e. 16π

3. A circular garden twenty feet in diameter is surrounded by a path three feet wide. What is the area of the path?

a. 9π square feet b. 51π square feet c. 60π square feet

d. 69π square feet e. 90π square feet

4. If one cubic foot of water equals 7.5 gallons, how long will it take for a faucet which flows at the rate of 10 gal/ min to fill a cube 2 feet on each side?

a. 4 minutes b. 5 minutes c. 6 minutes d. 7 minutes e. 8 minutes

5. A circular pool is ten feet in diameter, and five feet deep. What is its volume, in cubic feet?

a. 50 cubic feet b. 50π cubic feet c. 125π cubic feet

d. 250π cubic feet e. 500π cubic feet

10. How many degrees are included between the hands of a clock at 8:46 pm?

a. 11° b. 13° c. 18° d. 23° e. None of these

10. How many degrees are included between the hands of a clock at 2:24 pm?

a. 64° b. 72° c. 54° d. 86° e. None of these

8. If the length of a rectangle is increased by 50% and width is decreased by 40%, what happens to the area of the rectangle?

a. 10% increased b. 10% decreased c. 20% increased b. 20% decreased e. None

9. If a wheel travels 440 meters in 10 revolutions, what is the radius of the wheel in meter?

a. 5 b. 7 c. 14 d. 21 e. 28

10. The 20-inch-diameter wheels of one car travel at a rate of 24 revolutions per minute, while the 30-inch-diameter wheels of another car travel at a rate of 18 revolutions per minute. What is the ratio of the speed of the second car to that of the first?

a. 8:9 b. 3:2 c. 4:3 d. 6:5 e. 9:8

Answer Sheet

1. ☐ ☐ ☐ ☐ ☐
2. ☐ ☐ ☐ ☐ ☐
3. ☐ ☐ ☐ ☐ ☐
4. ☐ ☐ ☐ ☐ ☐
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SCORE……

REMARKS……