

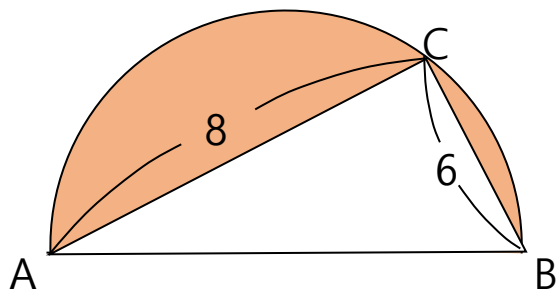
Grade 10. Assessment test

Problem 1.

What is the area of a circle with a circumference of 16π ?

- A. 32π
- B. 36π
- C. 42π
- D. 64π
- E. 81π

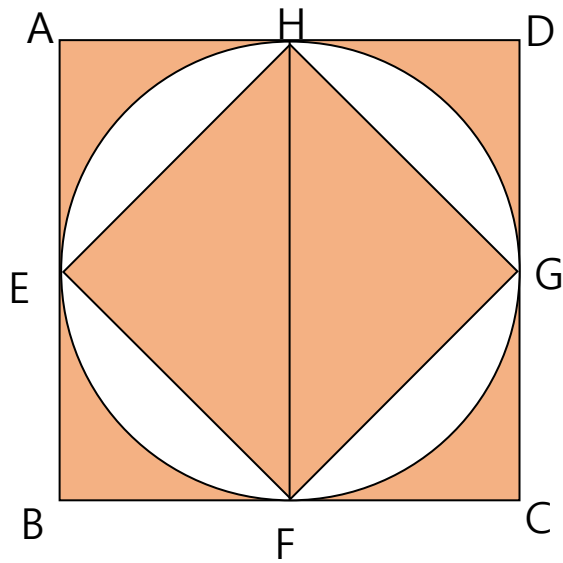
Problem 2.



In the figure above, arc ACB is a circle of which AB is a diameter. If $AC=8$ and $BC=6$, what is the area of the shaded region?

- A. $25\pi-48$
- B. $25\pi-24$
- C. $12.5\pi-24$
- D. $12.5\pi-48$
- E. $50\pi-24$

Problem 3.



In the figure above, ABCD is a square. A circle which is inscribed in ABCD has a square inside as same as inscribed itself. What is the area of the shaded regions if the area of circle is π ?

- A. $4 - \pi$
- B. $6 + \pi$
- C. $4 + \pi$
- D. $6 - 2\pi$
- E. $6 - \pi$

Problem 4.

If the circumference of a circle of radius r inches is equal to the perimeter of a square with a side length of s inches, $\frac{r}{s} = ?$

- A. $\frac{4}{\pi}$
- B. $\frac{2}{\pi}$
- C. $\sqrt{\frac{2}{\pi}}$
- D. $\frac{\sqrt{2}}{\pi}$
- E. $\frac{1}{\pi}$

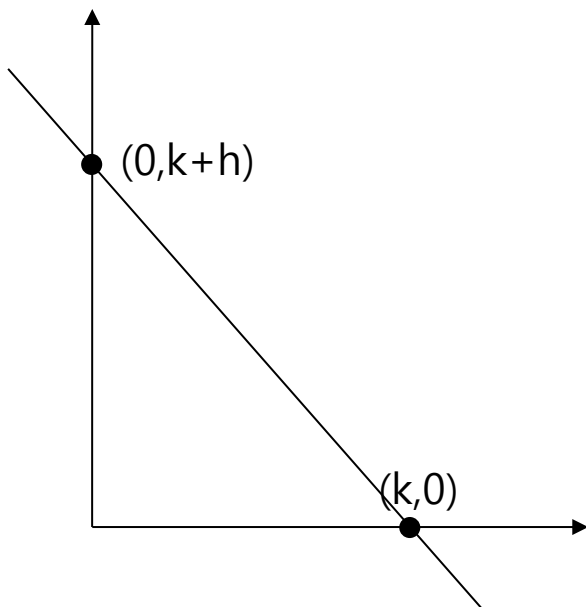
Problem 5

The volume of a cylinder of radius r is $\frac{1}{8}$ of the volume of a rectangular box with a square base of side length K . If the cylinder and the box had same heights, what is r in terms of k ?

- A. $\frac{k}{2\sqrt{2\pi}}$
- B. $\frac{k}{2\sqrt{\pi}}$
- C. $\frac{2k}{\sqrt{\pi}}$
- D. $\frac{k}{\sqrt{\pi}}$
- E. $\frac{k}{2\sqrt{\pi}}$

Problem 6.

In the figure above, if the slope of line l is h , what is h in terms of k ?



- A. $\frac{k}{k+1}$
- B. $\frac{k}{k-1}$
- C. $\frac{-k}{k+1}$
- D. $K+1$
- E. $K-1$

Problem 7.

If p and r are positive integers and $2p+r+1=2r+p+1$, which of the following must be true?

- I. p and r are consecutive integers.
 - II. p is even
 - III. r is odd.
- A. None.
 - B. I only
 - C. II only
 - D. III only
 - E. I, II and III

Problem 8.

What statement is true for all real values of x and y ?

- A. $x^5 \div x^3 = x^2$
- B. $(x + y)^2 = x^2 + xy + y^2$
- C. $x^4 - x = x^3$
- D. $(2x)^3 = 6x^3$
- E. $x^4 + x^4 = x^8$

Problem 9.

If $(x + \frac{1}{x})^2 = 15$, then $x^2 + \frac{1}{x^2} = ?$

- A. 15
- B. 14
- C. 11
- D. 13
- E. 12

Problem 10.

For $x, y > 0$, which expression is equal to $\frac{\frac{1}{xy}}{\frac{1}{x} + \frac{1}{y}} = ?$

- A. $\frac{x+y}{xy}$
- B. $x+y$
- C. $\frac{1}{x+y}$
- D. $\frac{x+y}{2xy}$
- E. $\frac{2}{x+y}$

Problem 11.

For which of the following equation is $x = -2$ root?

- i. $\frac{1}{x} - 2x = 0$
- ii. $(x + 2)^2 = 0$
- iii. $x^2 + 4x + 4 = 0$

- A. I only
- B. I and II only
- C. II and III only
- D. III only
- E. None

Problem 12.

If $0 < x^2 < y$, which of the following statements is (are) always true?

- I. $x < \frac{y}{x}$
 - II. $x^4 < x^2y$
 - III. $\frac{x^2}{y} > 1$
- A. I only
 - B. II only
 - C. I and II only
 - D. II and III only
 - E. III only

Problem 13

If $a > b > c > 0$, which of following statements must be true?

- I. $\frac{a-c}{b-a} > \frac{b-c}{b-a}$
 - II. $ab > ac$
 - III. $\frac{b}{a} > \frac{b}{c}$
- A. I only
 - B. II only
 - C. III only
 - D. I and II
 - E. II and III

Problem 14.

Which of the following statements must be true when $a^2 < b^2$ and a and b are not 0 ?

- I. $\frac{a^2}{a} < \frac{b^2}{a}$
- II. $\frac{1}{a^2} > \frac{1}{b^2}$
- III. $(a + b)(a - b) < 0$

- A. I only
- B. II only
- C. I and II
- D. II and III
- E. III only

Problem 15.

If $K = x^{\frac{1}{2}}$, $g = \frac{1}{x^2}$, then $\left(\frac{g}{k}\right)^4 =$

- A) X^5
- B) X^8
- C) X^{10}
- D) $-X^{10}$
- E) $-X^5$

Problem 16.

If $30x^{-1}y = 5xy^{-1}$, and x and y are positive, what is x in terms of y ?

A) $2\sqrt{3}y$

B) $\pm\sqrt{3}y$

C) $3y^2$

D) $6y^2$

E) $\sqrt{6}y$

Problem 17.

If $x, y \neq 0$, $x^{-1} + x^{-1} + x^{-1} = K$ and $y^{-1} + y^{-1} = Q$, then $\frac{Q}{K}$?

A) $\frac{x}{3y}$

B) $\frac{2x}{3y}$

C) $\frac{3y}{2x}$

D) $\frac{y}{3x}$

E) $\frac{xy}{3y}$

Problem 18.

If $3^x + 3^x + 3^x = 27^y$ then $y =$

- A) $\frac{x}{3}$
- B) $\frac{x+1}{2}$
- C) $\frac{x+2}{3}$
- D) $\frac{x+1}{3}$
- E) $\frac{3x}{2}$

Problem 19.

If $|x| \leq 3$, $|y| \leq 2$, then what is the least possible number of $x-y$?

- A) 1
- B) -1
- C) -3
- D) -5
- E) 0

Problem 20.

If $3|a| = 1$ and $|b| = a - 1$, then b^2 could be

A) $\frac{1}{3}$

B) $-\frac{4}{9}$

C) $\frac{4}{9}$

D) $\frac{1}{6}$

E) $-\frac{1}{6}$