
Problem 1

Point 1

$$3 \cdot 10^4 + 2 \cdot 10^2 + 4 \cdot 10 =$$

- a) 302400 b) 32400 c) 30240 d) 3240

Problem 2

Point 1

After a 20% reduction the sales price of a car is \$12,590. What is the original price?

- a) \$14,310.40 b) \$14,990.90 c) \$15,290.70 d) \$15,737.50

Problem 3

Point 1

If the average (arithmetic mean) of 8, 12, 15, 21, x and 11 is 17 then what is x?

- a) 42 b) 35 c) 17 d) 15

Problem 4

Point 2

83,000 equals:

- a) 83.0×10^4 b) 8.3×10^4 c) 8.3×10^3 d) 83.0×10^2

Problem 5**Point 2**

0.00875 equals:

- a) 8.75×10^{-2} b) 8.75×10^{-3} c) 87.5×10^{-3} d) 875×10^{-4}

Problem 6**Point 1**Which of the following fractions is larger than $2\frac{1}{4}$ but smaller than $2\frac{2}{5}$?

- a) $2\frac{3}{8}$ b) $2\frac{1}{2}$ c) $2\frac{6}{11}$ d) $2\frac{5}{9}$

Problem 7**Point 2**

X	Y
2	5
3	10
4	17
5	26

Which of the following describes the relationship between X and Y as shown in the pairs of numbers in the table above?

- a) $Y = 2X + 1$ b) $Y = X^2 + 1$ c) $Y = 3X - 1$ d) $Y = X^2 - 1$

Problem 8

Point 2

If $x < x^3 < x^2$, which of the following could be a value for x ?

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

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

c) $-\frac{5}{2}$

d) $-\frac{2}{5}$

Problem 9

Point 3

How many numbers between 200 and 400 meet **one or both** of the conditions given in the two statements below?

Statement 1: The number begins with 3

Statement 2: The number ends with 3

a) 60

b) 100

c) 110

d) 120

Problem 10

Point 2

The average (arithmetic mean) of six numbers is 4. If the average of two of those numbers is 2, what is the average of the other four numbers?

a) 5

b) 6

c) 7

d) 8

Problem 11

Point 1

If $V = \frac{12R}{r+R}$ then $R =$

- a) $\frac{Vr}{12-V}$ b) $Vr + \frac{V}{12}$ c) $Vr + 12$ d) $\frac{V}{r-12}$

Problem 12

Point 1

$3x + y = 19$, and $x + 3y = 1$. Find the value of $2x + 2y$.

- a) 20 b) 18 c) 10 d) 5

Problem 13

Point 1

If x and y are integers, and $3x + 2y = 13$, which of the following could be the value of y ?

- a) 1 b) 2 c) 3 d) 4

Problem 14

Point 1

If $x^2 - y^2 = 55$, and $x - y = 11$, then $y =$

- a) 8 b) 3 c) -8 d) -3

Problem 15

Point 1

What is the simplified result of following the steps below in order?

- (1) add $5y$ to $2x$
- (2) multiply the sum by 3
- (3) subtract $x + y$ from the product

- a) $5x + 14y$ b) $5x + 16y$ c) $5x + 5y$ d) $3x + 12y$

Problem 16

Point 1

Solve the following equation $\frac{2x}{3} = 8 + 4x$.

- a) -2.4 b) 2.4 c) 1.3 d) -1.3

Problem 17

Point 1

If $r = 5z$ and $15z = 3y$, then $r =$

- a) y b) $2y$ c) $10y$ d) $15y$

Problem 18

Point 1

If $y = 3$, then $y^3 \cdot (y^3 - y) =$

- a) 300 b) 459 c) 999 d) 648

Problem 19**Point 1**Simplify the expression $\frac{(4^x + 2^{2x})}{2^x}$.

a) 2^x

b) 6

c) $2 + 2^x$

d) 2^{x+1}

Problem 20**Point 1**Simplify the expression $\frac{(2x^2 - 5x - 12)}{(2x^2 - 4x - 16)}$.

a) $\frac{(x-6)}{2(x-2)}$

b) $\frac{(x-6)}{2(x+2)}$

c) $\frac{(2x+3)}{2(x-2)}$

d) $\frac{(2x+3)}{2(x+2)}$

Problem 21**Point 2**Find the sum of all solutions of the equation $\log_2(-6x - x^2) = 3$.

a) -6

b) -8

c) 2

d) 6

Problem 22

Point 3

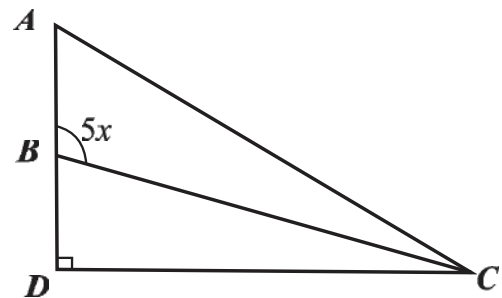
Solve the inequality $4x^3 + 10x^2 - 24x < 0$.

- a) $(-\infty, -4) \cup (0, 1.5)$ b) $(-\infty, 4)$ c) $(0, 1.5)$ d) $(-4, 0) \cup (1.5, +\infty)$

Problem 23

Point 1

If the angle is measured in grads, which of the following could be a value of x , in the diagram above?

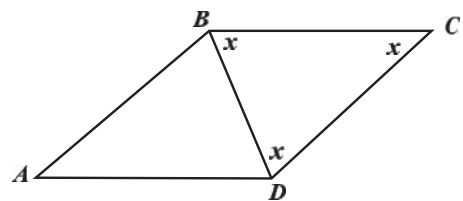


- a) 5 b) 10 c) 20 d) 40

Problem 24

Point 1

ABCD is a parallelogram. $BD = 2$. The angles of triangle BCD are all equal. What is the perimeter of the parallelogram?

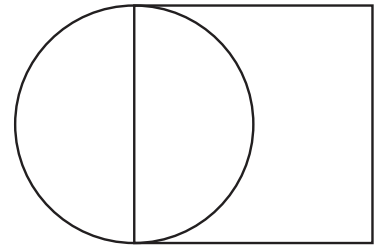


- a) 12 b) 9 c) 8 d) $3\sqrt{3}$

Problem 25

Point 1

In the figure above the square has two sides which are tangent to the circle. If the area of the circle is $4a^2\pi$, what is the area of the square?



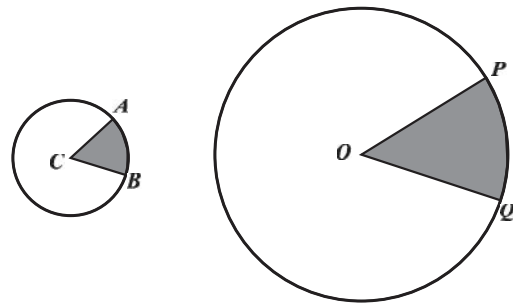
- a) $64a^2$ b) $4a^2$ c) $2a^2$ d) $16a^2$

Problem 26

Point 1

Radius of circle centered at O is 3 times the radius of circle centered at C.

Angle ACB = Angle POQ.



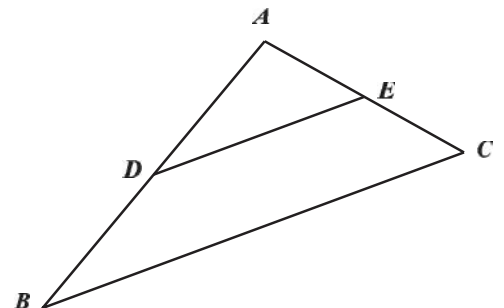
If the shaded area of circle centered at C is 2 then what is the area of the shaded part of circle centered at O ?

- a) 12 b) 18 c) 6 d) 36

Problem 27

Point 1

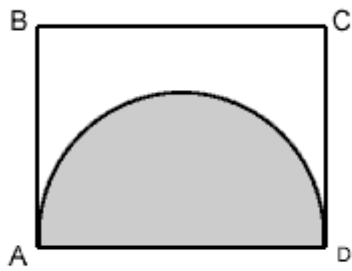
In triangle ABC, $AD = DB$, DE is parallel to BC, and the area of triangle ABC is 40. What is the area of triangle ADE ?



- a) 15 b) 10 c) 20 d) it cannot be determined from the information given

Problem 28

Point 1



(figure not to scale)

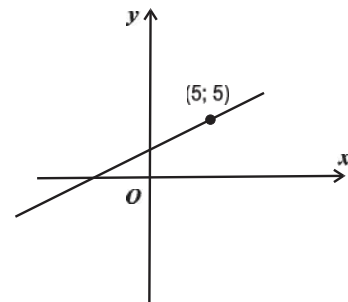
Rectangle ABCD has a perimeter of 26. The half circle with diameter AD has an area of 8π . What is the area of the rectangle?

- a) 60 b) 40 c) 30 d) 20

Problem 29

Point 2

The slope of the line passing through the point (5,5) is $5/6$. Which one of the following points belong to this line?

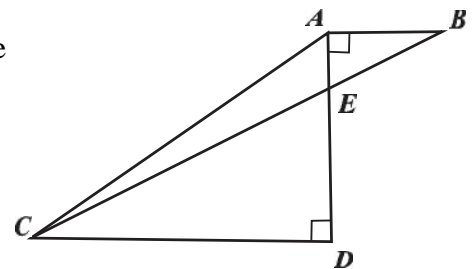


- a) (-1, 1) b) (8, 8) c) (8, 7) d) (11, 10)

Problem 30

Point 2

In the figure above $AD = 4$, $AB = 3$ and $CD = 9$. What is the area of triangle AEC ?



- a) 18 b) 9 c) 4.5 d) 3

Problem 31

Point 1

$\sqrt{5}$ percent of $5\sqrt{5} =$

- a) 0.5 b) 0.05 c) 0.25 d) 2.5

Problem 32

Point 1

The number of degrees that the *hour hand* of a clock moves through between noon (12 o'clock in the day time) and 2.30 in the afternoon of the same day is

- a) 720 b) 180 c) 75 d) 60

Problem 33

Point 1

The number of degrees that the *minute hand* of a clock moves through between noon (12 o'clock in the day time) and 2.30 in the afternoon of the same day is

- a) 720 b) 1080 c) 900 d) 520

Problem 34

Point 1

If $x \blacksquare y = (x + y)^2 - (x - y)^2$, then $\sqrt{5} \blacksquare \sqrt{5} =$

- a) 5 b) 10 c) 0 d) 20

Problem 35

Point 1

If Ann is 6 years older than Sue, and John is 5 years older than Ann, and the total of their ages is 41. Then how old is Sue?

- a) 8 b) 10 c) 19 d) 21

Problem 36

Point 2

Which of the following is a common factor of both $x^2 - 4x - 5$ and $x^2 - 6x - 7$?

- a) $x + 1$ b) $x - 1$ c) $x - 5$ d) $x - 7$

Problem 37

Point 2

On a map, $\frac{1}{3}$ centimeters equals 15 kilometers. The distance between two towns on a map is $3\frac{2}{3}$ centimeters. How many kilometers are actually between the two towns?

- a) 16 b) 132 c) 88 d) 165

Problem 38

Point 3

The distance from town A to town B is 3 kilometers. C is 6 kilometers from B. Which of the following *could* be the distance from A to C?

- a) 1 b) 7 c) 2 d) 10

Problem 39

Point 3

A class contains an equal number of boys and girls. The average height of the boys is 160 centimeters. The average height of the all the students is 155 centimeters. What is the average height of the girls in the class?

- a) 145 b) 152 c) 150 d) 158

Problem 40

Point 3

x and y are integers, $x + y < 11$, and $x > 6$. What is the smallest possible value of $x - y$?

- a) 2 b) 4 c) -2 d) -4