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Konu : Mock Exams for Summer Holiday

2016-2017

MOCK EXAM 1: DATA, COUNTING, AND PROBABILITY

A FREE RESPONSE QUESTIONS

Recommended Time: 15 min.

1. A and B are independent events.

$$P(A') = \frac{1}{3} \quad \text{and} \quad P(A \cap B) = \frac{1}{2}$$

Given the above, what is $P(B)$?

Answer

2. How many distinct five-digit natural numbers can be written such that the product of their digits is 2058?

Answer

3. There are two couches behind one another, one for three people and one for four people.

In how many ways can three girls and four boys can be seated on the couches such that the girls are all together?

Answer

4. The number of groups of two that can be formed by picking two girls in a class is nine less than twice the number of boys in the class.

Find the number of girls.

Answer

5. Two dice are rolled.

If the sum is greater than 10, what is the probability that the numbers are equal?

Answer

B MULTIPLE CHOICE QUESTIONS

Recommended Time: 15 min.

1. $\left(\sqrt[3]{x} - \frac{2}{x}\right)^8$

What is the constant term when the above expression is expanded?

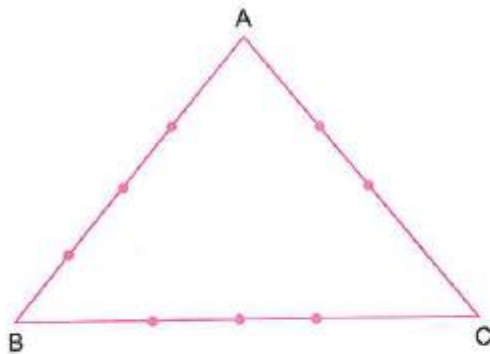
- A) 112 B) 96 C) 72 D) -48 E) -112

2. $\binom{15}{1} + \binom{15}{3} + \binom{15}{5} + \binom{15}{7} + \binom{15}{9} + \binom{15}{10} + \binom{15}{13} + \binom{15}{15}$

What is the result of the above expression?

- A) 2^{16} B) 2^{15} C) 2^{14} D) 2^{13} E) 2^{12}

3.



Out of eight points on triangle ABC, three are picked.

Given that it is known that a triangle is formed by connecting these points by line segments, what is the probability that a side of the triangle coincides with [BC]?

- A) $\frac{5}{38}$ B) $\frac{7}{36}$ C) $\frac{5}{18}$ D) $\frac{7}{18}$ E) $\frac{4}{9}$

4. Out of five doctors and four nurses, in how many distinct ways can a team of three be formed such that each team has at least one doctor?

- A) 72 B) 76 C) 79 D) 80 E) 82

C FILL IN THE BLANKS

Recommended Time: 15 min.

1. Based on the set K , answer the questions and write the answers in the boxes.

$K = \{1, 2, 3, 4, 5, 6, 7\}$	a. Number of even three-digit numbers formed by using the elements of K .	
	b. Number of 2-permutations of K .	
	c. Number of 3-permutations of K that have 2 but not 3.	
	d. The probability that a random elements of K is a prime number.	
	e. Number of all three-digit numbers abc formed by using the elements of K such that $a < b < c$.	
	f. Number of subsets with three elements that add up to an even number	

2. When $\left(2x^2 - \frac{1}{x}\right)^6$ is expanded,

- a. the second term from the left is
- b. the constant term is
- c. the coefficient of the fifth term from the right is
- d. the term in the middle is

D MATCH THE CORRECT ANSWERS

Recommended Time: 10 min.

Find the answers to the following questions on the right and match them.

1. The coefficient of the term with x^8 when $\left(x^2 - \frac{3}{x}\right)^7$ is expanded.

10

2. The number of all six-digit numbers written by rearranging the digits in 110205.

210

3. The value of $P(n, 2)$ if $C(n, 3) = C(n, 12)$.

189

4. The number of subsets of $\{a, b, c, d, e, f\}$ with four elements that have d.

120

E TRUE OR FALSE

Recommended Time: 10 min.

Identify the following statements as true or false by checking the boxes.

1. When $(\sqrt[3]{2} + \sqrt{5})^{10}$ is expanded, there are two rational terms.

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2. $P(n, r) = C(n, r) \cdot r!$

3. There are 10 distinct ways to split a group of six people into two teams of three.

4. Out of a bag with four blue and five red balls, the probability that two balls drawn one after another without replacement have the same colour is $\frac{1}{6}$.

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MOCK EXAM 2: OPERATIONS WITH FUNCTIONS AND THEIR APPLICATIONS

A FREE RESPONSE QUESTIONS

Recommended Time: 15 min.

1. $f = \{(1, -2), (2, 4), (4, -3), (5, 3)\}$
 $g = \{(-2, 1), (2, -3), (3, 1), (5, 2)\}$

Given the above functions, what is the sum of all elements of the image of $(f + g)$?

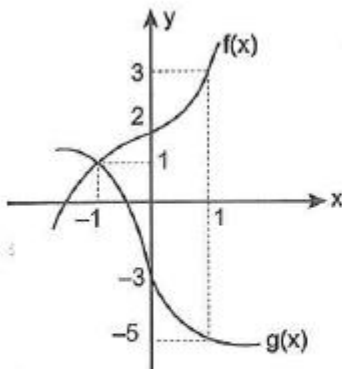
Answer

2. $f(x) = 3x - 2$ and $g(x) = x + 3$

Given the above functions, find $(f^{-1} \circ g)^{-1}(x)$.

Answer

3.



Given the functions $f(x)$ and $g(x)$ in the figure, evaluate the following expressions.

- a. $(g \circ f)(-1) =$
 b. $(f \circ g^{-1})(-5) =$
 c. $(f + g)(1) - (f \cdot g)(-1) =$

Answer

4. $f(x)$ is an odd function.

$$x \cdot f(x) - x^2 = 3x + f(-x)$$

Given the above, what is $f(3)$?

Answer

B MULTIPLE CHOICE QUESTIONS

Recommended Time: 15 min.

1. $f\left(\frac{x+1}{2}\right) = 2x - 1$

Given the above, what is $f^{-1}(5)$?

- A) 2 B) 3 C) 4 D) 5 E) 6

2. $f(x) = 3x - 1$

$$(g \circ f)(x) = 9x^2 - 6x + 1$$

Given the above, which one is $g(x)$?

- A) $3x^2 - 1$ B) x^2 C) $3x - 1$ D) $3x + 1$ E) $9x - 2$

3. f is a one-to-one and onto function defined as

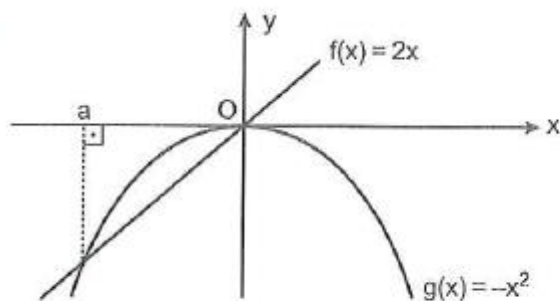
$$f: \mathbb{R} - \{3\} \rightarrow \mathbb{R} - \{1\}$$

$$f(x) = \frac{ax - 3}{2x + b}$$

Given the above, what is $a + b$?

- A) 0 B) -1 C) -2 D) -3 E) -4

4.



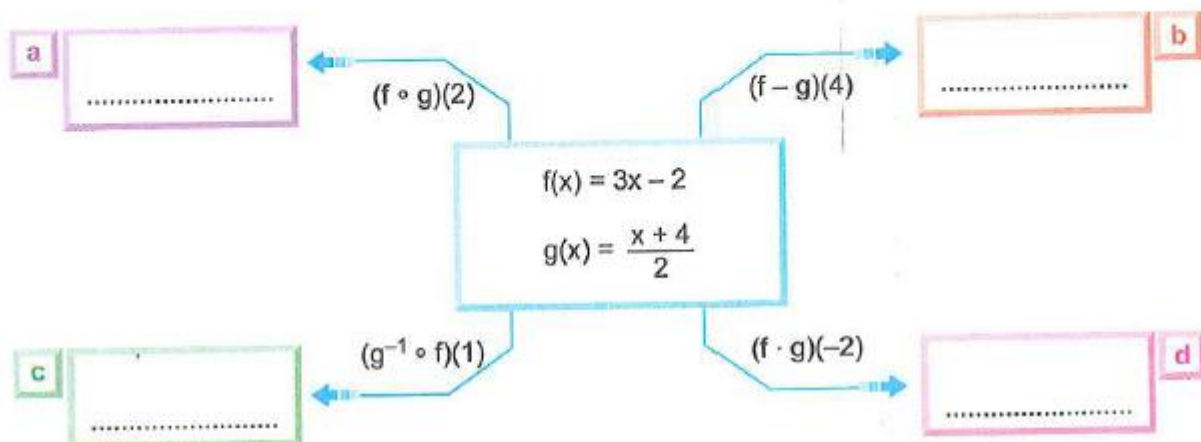
Given the graphs of the functions $f(x)$ and $g(x)$ in the figure, what is $(f \circ g)(a)$?

- A) -8 B) -6 C) -4 D) 4 E) 8

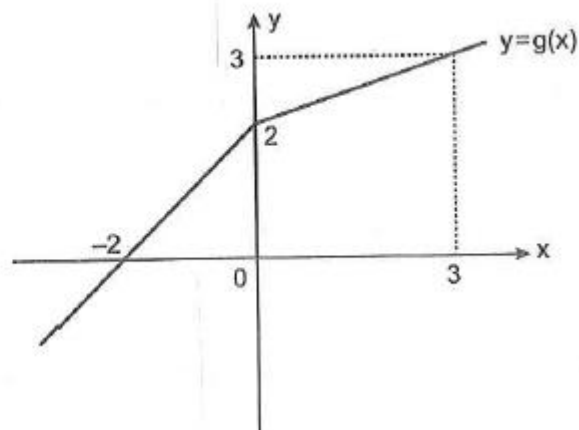
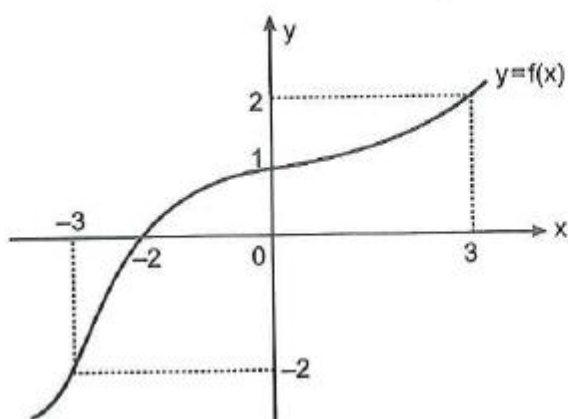
C FILL IN THE BLANKS

Recommended Time: 15 min.

1. Given the functions $f(x)$ and $g(x)$, write the result of the operations in the boxes.



2.



Given the graphs of $y = f(x)$ and $y = g(x)$ in the above figure, fill in the blanks below.

a $(g \circ f)(-2) = \dots\dots\dots$

b $(f \circ g^{-1})(-1) = \dots\dots\dots$

c $f^{-1}(1) + g^{-1}(3) = \dots\dots\dots$

d $(f^{-1} \circ g)^{-1}(3) = \dots\dots\dots$

D MATCH THE CORRECT ANSWERS

Recommended Time: 10 min.

Given the functions $f(x) = x^2$ and $g(x) = 3x - 1$, evaluate the following expressions and match them with the answers on the opposite side.

1 $(f \circ g^{-1})(5)$

2

2 $(f + g)(1)$

15

3 $(g \circ f)(-1)$

4

4 $(2f - g)(-2)$

3

E TRUE OR FALSE

Recommended Time: 10 min.

Identify the following statements as true or false by checking the boxes.

1. If $f(x)$ is even, then $f(-3) = f(3)$.
2. The inverse of the identity function is equal to itself.
3. If $f : \{(1, 2), (3, 4)\}$, then $f^{-1}(4) - f^{-1}(2) = 4$.
4. If $f^{-1}(x + 2) = g(2x - 1)$, then $(f \circ g)(3) = 1$.
5. If $f(x)$ is a linear function, then $(f \circ f)(x)$ is linear as well.

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MOCK EXAM 3: ANALYTICAL GEOMETRY, QUADRILATERALS & POLYGONS

A FREE RESPONSE QUESTIONS

Recommended Time: 15 min.

1. $(m - 2)x - my + 1 = 0$ and $3x - 2y + 5 = 0$

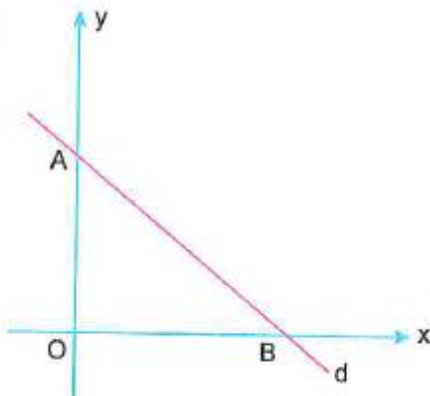
If the lines given by the above equations are parallel, what is m ?

Answer

2. If the distance of point $A(p, 4)$ to the line given by $x - 3y + 9 = 0$ is $2\sqrt{10}$, find the possible values of p .

Answer

3.



On the analytical plane in the figure, line d cuts the coordinate axes at points A and B .

$d: 3x + 4y - 24 = 0$

Given the above, find the coordinates of the centroid of triangle AOB .

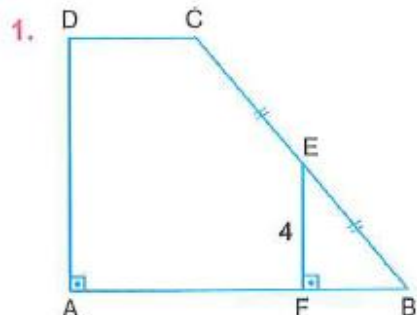
Answer

4. If the area of a rhombus is 12 in^2 and its perimeter is $4\sqrt{15} \text{ in}$, what is the sum of the lengths of its diagonals in inches?

Answer

B MULTIPLE CHOICE QUESTIONS

Recommended Time: 15 min.



ABCD is a right-angled trapezium.

 $EF \perp AB$ $|EC| = |EB|$ $|EF| = 4$ in $A(ABCD) = 48 \text{ in}^2$ Given the above, what is $|AF|$ in inches?

A) 6

B) 8

C) 9

D) 10

E) 12

2. $(n - 2)x + (4 - 3n)y + 1 = 0$

If the line given by the above equation is perpendicular to the x-axis, what is n ?

A) $\frac{3}{4}$

B) 1

C) $\frac{4}{3}$

D) 2

E) $\frac{5}{2}$

3. $x = -2 + 4k$

$y = 6 - 8k$

What is the slope of the line given by the above parametric equation?

A) -3

B) -2

C) $-\frac{1}{2}$

D) $\frac{1}{2}$

E) 2

4. $x + y - 6 = 0$ and $2x + 2y + 1 = 0$

Which one is the equation of the geometric locus of all points that are equidistant from the lines given by the above equations?

A) $2x + 2y - 3 = 0$

B) $2x + 2y - 4 = 0$

C) $x + y - 2 = 0$

D) $4x + 4y - 11 = 0$

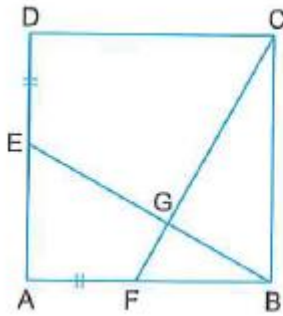
E) $4x + 4y - 13 = 0$

C FILL IN THE BLANKS

Recommended Time: 15 min.

1. On the analytical plane, the area of the region bounded by the lines $|y| = 3$, $x = 2$ and $x = -1$ is

2.



ABCD is a square. $[EB] \cap [FC] = \{G\}$

If $|DE| = |AF|$, then $\widehat{AEB} \cong \dots$

3. In a triangle with vertices $A(-1, 2)$, $B(4, -1)$ and $C(0, 3)$, the length of the altitude that belongs to side $[AC]$ is

4. In a triangle with vertices $A(-1, 4)$, $B(2, -5)$ and $C(2, 7)$, the distance of the centroid from the origin is

D MATCH THE CORRECT ANSWERS

Recommended Time: 10 min.

Find the answers of the following questions in the boxes and match them.

1

What is the distance between point $A(-3, 1)$ and the line given by $4x - 3y + 5 = 0$?

6

2

If the line given by $kx - (k - 2)y + 4 = 0$ passes through $A(-1, 1)$, what is k ?

3

3

What is the slope of the line that intersects the coordinate axes at $A(0, -12)$ and $B(2, 0)$?

2

E TRUE OR FALSE

Recommended Time: 10 min.

Identify the following statements as true or false by checking the boxes.

1. A line has positive slope if it makes an angle of 90° with the x-axis in positive direction.
2. The slope of lines parallel to the y-axis is zero.
3. In a parallelogram, the angle between the diagonals is 90° .
4. A regular polygon in which the measure of each external angle is 40° has 8 sides.
5. In an isosceles trapezium, the diagonals are equal in length.

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MOCK EXAM 4: QUADRATIC EQUATIONS AND FUNCTIONS

A FREE RESPONSE QUESTIONS

Recommended Time: 15 min.

1. k is a root of $x^2 - (m - 2)x + 3 = 0$.

$$k + \frac{3}{k} = 5$$

Given the above, find m .

Answer

2. $3x_1x_2 - 2x_1 - 2x_2 = 1$

$$x_1x_2 + x_1 + x_2 = 7$$

Write a second-degree equation such that its roots x_1 and x_2 are related by the above expressions.

Answer

3. Find the coordinates of the vertex of the graph of $f(x) = -2(x + 1)^2 + 1$.

Answer

4. $f(x) = x^{2012} + x^{2011} + x^{2010} + x^{2009} + \dots + x^2 + x + 1$

Given the above, evaluate $f\left(\frac{1+i}{1-i}\right)$.

Answer

B MULTIPLE CHOICE QUESTIONS

Recommended Time: 15 min.

1. m is a positive real number.

$$x^2 - 4mx + 4m^2 = 0$$

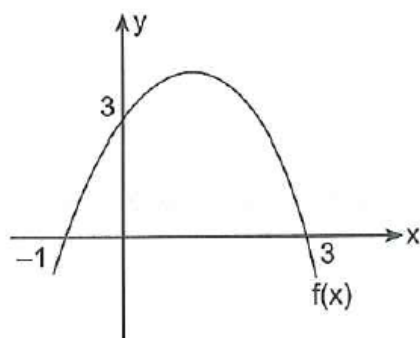
x_1 and x_2 are the roots of the above equation.

$$\frac{\sqrt{x_1}}{x_2} + \frac{1}{\sqrt{x_1}} = 2$$

Given the above, what is m ?

- A) $\frac{1}{4}$ B) $\frac{1}{3}$ C) $\frac{1}{2}$ D) 1 E) 2

- 2.



What is the maximum value of the function $f(x) = ax^2 + bx + c$ whose graph is given in the figure?

- A) 8 B) 7 C) 6 D) 5 E) 4

3. If the parabola given by $f(x) = ax^2 - ax - 1$ does not intersect the x -axis, what is the sum of all possible integer values of a ?

- A) -4 B) -5 C) -6 D) -7 E) -8

4. $z_1 = 2 + i$ and $z_2 = 1 - 3i$

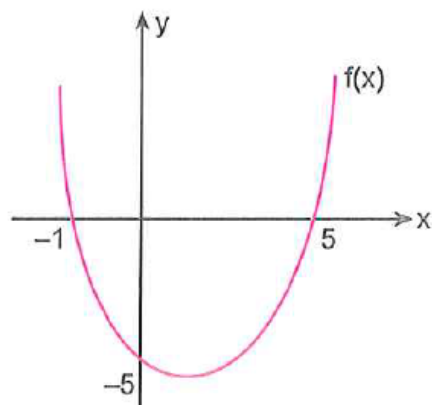
Given the above, what is the imaginary part of the result of $z_1 + z_2 - \overline{z_1} \cdot z_2$?

- A) -7 B) -3 C) 1 D) 3 E) 5

G FILL IN THE BLANKS

Recommended Time: 15 min.

1.



Given the parabola in the figure, fill in the blanks.

- a) Equation of $f(x)$:
- b) Value of $f(1)$:
- c) Axis of symmetry of $f(x)$:
- d) Minimum value of $f(x)$:
- e) Image of $f(x)$:

2. Fill in the gaps in the table below.

z_1	z_2	z_3	$z_1 \cdot z_2$	$z_1 + z_2 - z_3$	$\frac{z_1}{z_3}$	$\frac{z_1 - z_2}{z_3}$
$1 + i$	$1 - i$	$3 - i$				
2	$1 + 2i$	$-i$				
$3i$	0	$3 + 2i$				

D MATCH THE CORRECT ANSWERS

Recommended Time: 10 min.

1

The sum of coordinates of the vertex of the graph of $f(x) = -2x^2 + 4x - 1$.

$$\frac{5}{2}$$

2

The sum of the reciprocal of the roots of $ax^2 - 5x + 2 = 0$.

$$-\frac{1}{2}$$

3

The greater root of $x^2 - 4x + 1 = 0$.

$$2 + \sqrt{3}$$

4

The real part of $\frac{1 + 2i}{1 - i}$.

$$2$$

E TRUE OR FALSE

Recommended Time: 10 min.

Identify the following statements as true or false by checking the boxes.

- The negative root of $x^2 + 5x - 3 = 0$ has a greater absolute value than its positive root.
- If $2\sqrt{2} - 3$ is a root of a second-degree equation with one unknown and rational coefficients, the other one is $2\sqrt{2} + 3$.
- The parabola given by $f(x) = x^2 - 5x + 7$ intersects the x-axis at two distinct points.
- The complex conjugate of $z = 5i$ is $-5i$.
- The roots of second-degree equations with discriminants larger than zero are not real.

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MOCK EXAM 5: POLYNOMIALS

A FREE RESPONSE QUESTIONS

Recommended Time: 15 min.

1. $P(x) = x^3 - 3x^2 + 2x - 1$

$Q(x) = x^2 - 2x + 5$

Given the above polynomials, find $x \cdot Q(x) - P(x)$.

Answer

2. $P(x) = 3x^{15} - 4x^{12} + x^6 - 2x + 1$

Find the sum of coefficients of the quotient polynomial resulting from dividing the above polynomial by $x + 1$.

Answer

3. $P(x) - 2P(-x) = 9x + 5$

Given the above, find $P(1)$.

Answer

4. $\frac{x^3 + 27}{x^2 + x - 6} \cdot \frac{x^2 - 3x + 9}{x^2 - 2x}$

Find the simplest form of the above expression.

Answer

5. $x^4 - 4x^3y + 6x^2y^2 - 4xy^3 + y^4$

Evaluate the above expression at $x = 2011$ and $y = 2010$.

Answer

B MULTIPLE CHOICE QUESTIONS**Recommended Time: 15 min.**

1. $(x^2 + 5x)^2 - 2(x^2 + 5x) - 24$

Which one is not a factor of the above expression?

- A) $x - 1$ B) $x + 1$ C) $x - 4$ D) $x + 4$ E) $x + 6$

2. $\frac{x\sqrt{x} + y\sqrt{y}}{x + y + 2\sqrt{xy}} : \frac{x + y - \sqrt{xy}}{x - y}$

Which one is equal to the above expression?

- A) -1 B) 1 C) $\sqrt{xy}$ D) $\sqrt{x} + \sqrt{y}$ E) $\sqrt{x} - \sqrt{y}$

3. $P(x) = 2x^4 + 3x^3 - x^2 + x - 1$

What is the remainder when the above polynomial is divided by $x^2 - x + 1$?

- A) $-2x - 5$ B) $-2x - 3$ C) $-2x - 1$ D) $-2x + 3$ E) $2x - 3$

4. a and b are natural numbers.

$$P(x) = (x - 7)^{2a+1} + (x - 1)^a + 8^{b+1}$$

Given that $P(x)$ can be divided by $x - 5$, how are a and b related?

- A) $2a - 3b = 3$ B) $2a - b = 3$ C) $a - 2b = 3$ D) $2a + 3b = 2$ E) $2a + b = 2$

5. $\deg[P^2(x) \cdot Q(3x)] = 8$

$$\deg\left[\frac{P(x)}{Q(x)}\right] = 1$$

Given the above, what is the degree of $P(Q(x))$?

- A) 2 B) 3 C) 4 D) 5 E) 6

C FILL IN THE BLANKS

Recommended Time: 15 min

1. Fill in the gaps in the table below.

Function	Polynomial? (Y / N)	Degree of polynomial	Constant term of polynomial	Sum of coefficients of polynomial
$f(x) = -2x^3 + x^2 - 5$				
$f(x) = -\frac{2}{x} + x^2$				
$f(x) = \sqrt[3]{2}x - 3$				
$f(x) = \sqrt{x} + 2$				
$f(x) = 3$				
$f(x) = 0$				

2. Fill in the blanks in the following expressions.

a. $9^x - 16 = (3^x + 4) (\dots\dots\dots)$

b. $x^4 - 81 = (\dots\dots\dots) (\dots\dots\dots) (x^2 + 9)$

c. $a^2 - 8ab + 16b^2 = (\dots\dots\dots)^2$

d. $a^3 + 27 = (a + 3) (\dots\dots\dots)$

e. $x^2 + 4x - 5 = (x + 5) (\dots\dots\dots)$

f. $a^6 - b^6 = (a^2 - b^2) (\dots\dots\dots)$

D MATCH THE CORRECT ANSWERS

Recommended Time: 10 min.

Find the correct answers to the following questions on the right and match the puzzle pieces.

1

The sum of coefficients of $(x^3 + 3x^2 - 2)(x^2 + 2x - 1)^2$.

$$6x - 4$$

2

The remainder when $P(x) = x^{15} + x^{13} - 5x^4 + 2x^3 - 1$ is divided by $x^3 + 1$.

$$x^2 + 1$$

3

The value of $(x + 4)^2 - (x - 4)^2$.

$$8$$

4

The simplified form of $\frac{x^6 + 1}{x^4 - x^2 + 1}$.

$$16x$$

E TRUE OR FALSE

Recommended Time: 10 min.

Identify the following statements as true or false by checking the boxes.

1. For $m = 3$, $P(x) = x^{m-3} + 2x^{3-m} + 5x$ is a polynomial.

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2. The sum of coefficients of polynomial $P(2x - 5)$ is $P(0)$.

3. The remainder when polynomial $P(3x - 1)$ is divided by $x - 1$ is $P(2)$.

4. $t^2 + 6t + 9$ is a complete square.

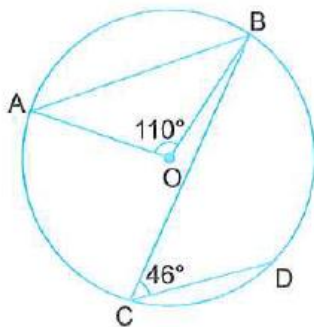
5. Simplifying $\frac{x^{-1} - x}{x^2 - x} \cdot \frac{x^2 + 2x + 1}{x^2}$ results in $-\frac{1}{x + 1}$.

MOCK EXAM 6: CIRCLES & GEOMETRIC BODIES

A FREE RESPONSE QUESTIONS

Recommended Time: 15 min.

1.



In the circle centred at O,

$AB \parallel CD$,

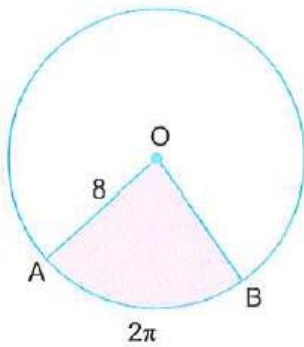
$$m(\widehat{AOB}) = 110^\circ,$$

$$m(\widehat{BCD}) = 46^\circ.$$

Given the above, what is $m(\widehat{CD})$ in degrees?

Answer

2.



In the circle centred at O,

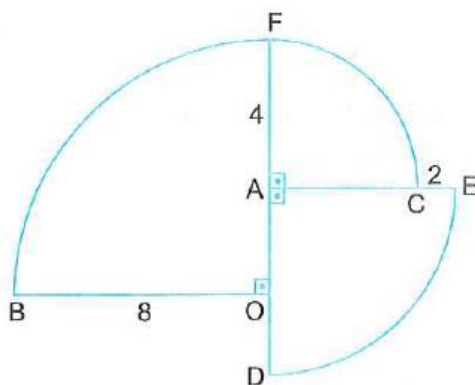
$$|OA| = 8 \text{ in.}$$

$$|\widehat{AB}| = 2\pi \text{ in.}$$

Given the above, what is the shaded area in square inches?

Answer

3.



The shape in the figure is made of quarter-circles.

$$|AF| = 4 \text{ cm}$$

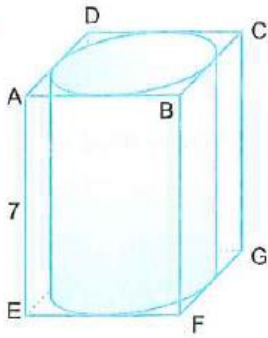
$$|CE| = 2 \text{ cm}$$

$$|BO| = 8 \text{ cm}$$

Given the above, what is the perimeter in cm?

Answer

4.



What is the lateral surface area of a largest right circular cylinder in square inches if it is the largest one that fits in a right square prism with a height of 7 inches and a volume of 112 cubic inches?

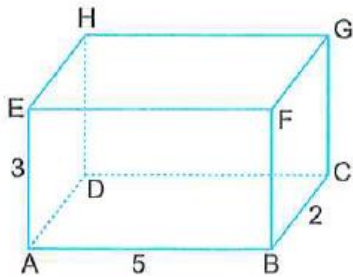
Answer



B MULTIPLE CHOICE QUESTIONS

Recommended Time: 15 min.

1.



The edges of a rectangular prism are 2 cm, 3 cm and 5 cm in length. It is split in cubes, each of which have edges 1 cm in length.

Given the above, what is the ratio of the total surface area of all cubes to that of the prism?

A) $\frac{45}{16}$

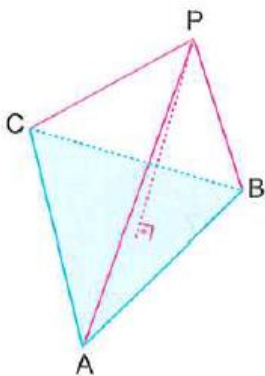
B) $\frac{90}{31}$

C) 3

D) $\frac{45}{14}$

E) $\frac{10}{3}$

2.



P is the apex of the equilateral triangular right pyramid, which has a height of 8 cm and a volume of $72\sqrt{3} \text{ cm}^3$.

Given the above, what is $|AP|$ in cm?

A) 8

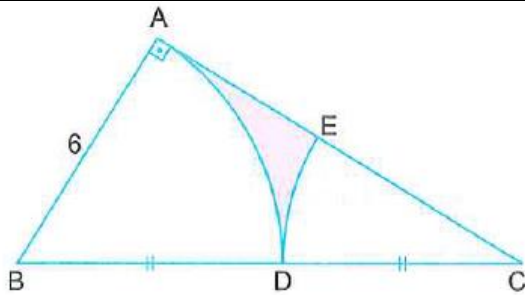
B) $6\sqrt{2}$

C) $4\sqrt{6}$

D) 10

E) $6\sqrt{3}$

3.



Circular sectors centred at B and C are drawn inside the right-angled triangle ABC.

$$|BD| = |CD|$$

$$|AB| = 6 \text{ cm}$$

Given the above, what is the shaded area in cm^2 ?

A) $18\sqrt{3} - 9\pi$

B) $18\sqrt{3} - 8\pi$

C) $18\sqrt{3} - 6\pi$

D) $12\sqrt{3} - 4\pi$

E) $12\sqrt{3} - 2\pi$

4. A container in the shape of a right circular cylinder with a radius of 5 cm and a height of 12 cm is filled 40% with water.

How many cm^3 of water should be added to make it 30% empty?

A) 60π

B) 75π

C) 80π

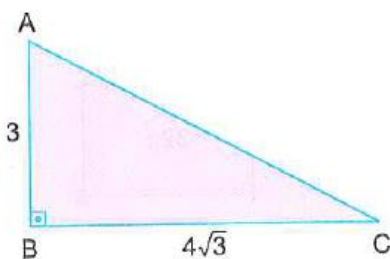
D) 90π

E) 105π

C FILL IN THE BLANKS

Recommended Time: 15 min.

1.



In the right-angled triangle in the figure,

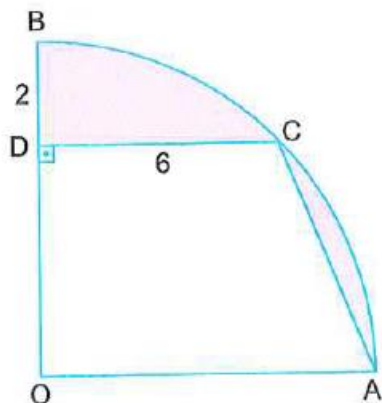
$$|AB| = 3 \text{ cm}$$

$$|BC| = 4\sqrt{3} \text{ cm.}$$

Given the above, the volume of the body formed by revolving the triangle around [AB] by is $12\pi \text{ cm}^3$.

2. When the lateral surface of a right circular cylinder with a volume of $75\pi \text{ cm}^3$ and a lateral surface area of $30\pi \text{ cm}^2$ is unfolded, the longer side of the resulting rectangle is cm in length.

3.



In the quarter-circle centred at O,

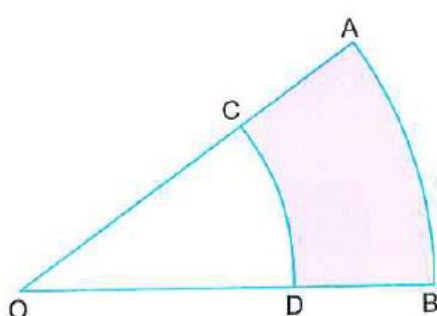
$CD \perp OB$

$|BD| = 2 \text{ cm}$

$|CD| = 6 \text{ cm}$

Given the above, the total area of the shaded regions is cm^2 .

4.



In the circular sectors centred at O,

$|OD| = 2 \cdot |BD|$

If the area of sector ODC is 56 cm^2 , the area of the shaded region is cm^2 .

D MATCH THE CORRECT ANSWERS

Recommended Time: 10 min.

Find the correct answers to the following questions in the boxes on the right and match them.

1

If the central angle that subtends a circular arc with radius 5 cm is 30 greater than the inscribed angle that subtends the same arc, what is the length of the arc in cm?

32π

2

What is the volume of the smallest right circular cylinder that contains a cube whose edges are 4 inches in length?

24π

3

How many cm is the base circumference of a cone that is formed by folding a quarter-circle with radius 48 cm?

2π

E TRUE OR FALSE

Recommended Time: 10 min.

Identify the following statements as true or false by checking the boxes.

1. The measure of the angle at the circumference subtended by $\frac{1}{5}$ of the circle is 72° .
2. The angle at the circumference subtended by the longest chord of the circle is 90° .
3. The ratio of the volumes of a right square pyramid and a right square prism sharing the same height and base is $\frac{1}{3}$.
4. Extending each edge of a cube by 10% increases its surface area by 60%.
5. Doubling the radius of a right circular cylinder quadruples its volume.

T

F

ANSWER KEY

MOCK EXAM - 1

A) 1) $\frac{3}{4}$ 2) 40 3) 432 4) 6 5) $\frac{1}{3}$

B) 1) A 2) C 3) C 4) D

C) 1. a) 147 b) 42 c) 60 d) $\frac{4}{7}$ e) 35 f) 19

2. a) $-192x^9$ b) 60 c) 240 d) $-160x^3$

D) 1) 189 2) 120 3) 210 4) 10

E) 1) T 2) T 3) T 4) F

MOCK EXAM - 2

A) 1) 6 2) $3x - 5$ 3) a. -5 b. 3 c. -3 4) $\frac{9}{2}$

B) 1) A 2) B 3) E 4) A

C) 1. a) 7 b) 6 c) -2 d) -8

2. a) 2 b) -2 c) 3 d) 0

D) 1) 4 2) 3 3) 2 4) 15

E) 1) T 2) T 3) F 4) F 5) T

MOCK EXAM - 3

- A) 1) -4 2) 23 and -17 3) $\left(\frac{8}{3}, 2\right)$ 4) $6\sqrt{3}$
- B) 1) A 2) C 3) B 4) D
- C) 1) 18 2) $\widehat{BFC}$ 3) $4\sqrt{2}$ 4) $\sqrt{5}$
- D) 1) 2 2) 3 3) 6
- E) 1) T 2) F 3) F 4) F 5) T

MOCK EXAM - 4

- A) 1) 7 2) $x^2 - 4x + 3 = 0$ 3) $(-1, 1)$ 4) 1
- B) 1) C 2) E 3) C 4) A
- C) 1. a) $f(x) = x^2 - 4x - 5$ b) -8
 c) Line $x = 2$ d) -9
 e) $[-9, \infty)$

MOCK EXAM - 5

- A) 1) $x^2 + 3x + 1$ 2) 1 3) -2 4) x 5) 1
- B) 1) C 2) E 3) B 4) A 5) E

2.

z_1	z_2	z_3	$z_1 \cdot z_2$	$z_1 + z_2 - z_3$	$\frac{z_1}{z_3}$	$\frac{z_1 - z_2}{z_3}$
$1 + i$	$1 - i$	$3 - i$	2	$-1 + i$	$\frac{1}{5} + \frac{2}{5}i$	$-\frac{1}{5} + \frac{3}{5}i$
2	$1 + 2i$	$-i$	$2 + 4i$	$3 + 3i$	$2i$	$2 + i$
$3i$	0	$3 + 2i$	0	$-3 + i$	$\frac{6}{13} + \frac{9}{13}i$	$\frac{6}{13} + \frac{9}{13}i$

- D) 1) 2 2) $\frac{5}{2}$ 3) $2 + \sqrt{3}$ 4) $-\frac{1}{2}$
- E) 1) T 2) F 3) F 4) T 5) F

C) 1.

Function	Polynomial? (Y / N)	Degree of polynomial	Constant term of polynomial	Sum of co- efficients of polynomial
$f(x) = -2x^3 + x^2 - 5$	Y	3	-5	-6
$f(x) = -\frac{2}{x} + x^2$	N	-	-	-
$f(x) = \sqrt[3]{2}x - 3$	Y	1	-3	$\sqrt[3]{2} - 3$
$f(x) = \sqrt{x} + 2$	N	-	-	-
$f(x) = 3$	Y	0	3	3
$f(x) = 0$	Y	Indeterminate	0	0

MOCK EXAM - 6

2. a) $3^x - 4$ b) $(x - 3) \cdot (x + 3)$

c) $a - 4b$ d) $a^2 - 3a + 9$

e) $x - 1$ f) $a^4 + a^2b^2 + b^4$

A) 1) 66° 2) 8π 3) $12 + 9\pi$ 4) 28π

B) 1) B 2) D 3) A 4) D

C) 1) 90° 2) 10π 3) $25\pi - 64$ 4) 70

D) 1) 8 2) $6x - 4$ 3) $16x$ 4) $x^2 + 1$ D) 1) 2π 2) 32π 3) 24π

E) 1) T 2) F 3) T 4) T 5) T E) 1) F 2) T 3) T 4) F 5) T