Maths Question Bank Answers:

8:

from math import \*

from sympy import\*

A=Point(3,4)

angle=radians(90)

d=A.rotate(angle)

print(d)

o/p: Point2D(-4, 3)

9:

from math import \*

from sympy import\*

A=Point(7,10)

angle=radians(90)

d=A.rotate(angle)

print(d)

o/p: Point2D(-10, 7)

10:

from math import \*

from sympy import\*

A=Point(-10,10)

angle=radians(45)

d=A.rotate(angle)

print(d)

o/p: Point2D(-14142135623731/1000000000000, 7105427357601/8000000000000000000000000000)

11:

from math import \*

from sympy import\*

A=Point(7,-7)

angle=radians(180)

d=A.rotate(angle)

print(d)

o/p: Point2D(-7, 7)

12:

from math import \*

from sympy import\*

A=Point(8,-8)

angle=radians(180)

d=A.rotate(angle)

print(d)

o/p: Point2D(-8, 8)

13:

from sympy import\*

A=Point(3,4)

d=A.scale(3,0)

print(d)

o/p: Point2D(9, 0)

14:

from sympy import\*

A=Point(4,9)

d=A.scale(6,0)

print(d)

o/p: Point2D(24, 0)

15:

from sympy import\*

A=Point(3,4)

d=A.scale(0,3)

print(d)

o/p: Point2D(0, 12)

16:

from sympy import\*

A=Point(3,4)

d=A.scale(0,10)

print(d)

o/p: Point2D(0, 40)

17:

from sympy import\*

A=Point(3,4)

x,y=symbols('x y')

d=A.reflect(Line(x+y))

print(d)

o/p: Point2D(-4, -3)

18:

from sympy import\*

x,y=symbols('x y')

L=Line((2,3),(4,3))

print(L)

n=L.equation()

print(n)

o/p:

Line2D(Point2D(2, 3), Point2D(4, 3))

y – 3

19:

from sympy import\*

x,y=symbols('x y')

s=Segment((0,0),(10,10))

print(s)

n=s.length

print(n)

o/p: Segment2D(Point2D(0, 0), Point2D(10, 10))

10\*sqrt(2)

20:

from sympy import\*

x,y=symbols('x y')

s=Segment((0,0),(3,10))

print(s)

n=s.length

print(n)

o/p: Segment2D(Point2D(0, 0), Point2D(3, 10))

sqrt(109)

21:

from sympy import\*

x,y=symbols('x y')

s=Segment((-1,1),(7,10))

print(s)

n=s.length

print(n)

o/p: Segment2D(Point2D(-1, 1), Point2D(7, 10))

sqrt(145)

22:

from sympy import\*

x,y=symbols('x y')

s=Segment((0,0),(10,10))

print(s)

n=s.midpoint

print(n)

o/p: Segment2D(Point2D(0, 0), Point2D(10, 10))

Point2D(5, 5)

23:

from sympy import\*

x,y=symbols('x y')

l=Line((2,3),(4,3))

print(l)

n=l.slope

print(n)

o/p: Line2D(Point2D(2, 3), Point2D(4, 3))

0

24:

from sympy import\*

x,y=symbols('x y')

l=Line((0,4),(8,-10))

print(l)

n=l.slope

print(n)

o/p: Line2D(Point2D(0, 4), Point2D(8, -10))

-7/4

25:

from sympy import\*

from pylab import \*

x,y=symbols('x y')

r=Ray((0,0),(4,4))

print(r)

angle=radians(90)

n=r.rotate(angle)

print('rotation thru 90 deg is',n)

o/p: Ray2D(Point2D(0, 0), Point2D(4, 4))

rotation thru 90 deg is Ray2D(Point2D(0, 0), Point2D(-4, 4))

26:

from sympy import\*

from pylab import \*

x,y=symbols('x y')

s=Segment((1,0),(2,-1))

print(s)

angle=radians(180)

n=s.rotate(angle)

print('rotation thru 180 deg is',n)

o/p: Segment2D(Point2D(1, 0), Point2D(2, -1))

rotation thru 180 deg is Segment2D(Point2D(-1, 24492935982947/200000000000000000000000000000), Point2D(-2, 1))

27:

from sympy import\*

p=Polygon((0,0),(1,0),(2,2),(1,4))

print(p)

n=p.area

print('area of polygon is',n)

o/p: Polygon(Point2D(0, 0), Point2D(1, 0), Point2D(2, 2), Point2D(1, 4))

area of polygon is 4

28:

Same ques

29:

from sympy import\*

p=Polygon((0,0),(1,0),(5,1),(0,1),(3,0))

print(p)

n=p.area

print('area of polygon is',n)

o/p: Polygon(Point2D(1, 0), Point2D(5, 1), Point2D(0, 1), Point2D(3, 0))

area of polygon is 3/2

30:

from sympy import\*

p=Polygon((0,0),(1,0),(2,2),(1,4))

print(p)

n=p.perimeter

print('perimeter of polygon is',n)

o/p: Polygon(Point2D(0, 0), Point2D(1, 0), Point2D(2, 2), Point2D(1, 4))

perimeter of polygon is 1 + sqrt(17) + 2\*sqrt(5)

31:

from sympy import\*

p=Polygon((0,0),(1,0),(2,2),(1,4))

print(p)

n=p.is\_convex()

print(n)

o/p: Polygon(Point2D(0, 0), Point2D(1, 0), Point2D(2, 2), Point2D(1, 4))

True

32:

from sympy import\*

p=RegularPolygon((0,0),5,n=8)

print(p)

n=p.perimeter

print(‘perimeter=’,n)

o/p: RegularPolygon(Point2D(0, 0), 5, 8, 0)

perimeter=40\*sqrt(2 - sqrt(2))

33:

from sympy import\*

p=RegularPolygon((0,0),8,n=5)

print(p)

n=p.perimeter

print(‘perimeter=’,n)

o/p: RegularPolygon(Point2D(0, 0), 8, 5, 0)

perimeter=8\*sqrt(-sqrt(5 - sqrt(5))\*sqrt(sqrt(5) + 5) + 10) + 12\*sqrt(10 - 2\*sqrt(5))

34:

from sympy import\*

p=RegularPolygon((0,0),5,n=8)

print(p)

a=p.perimeter

b=p.area

print('perimeter=',a)

print('area=',b)

o/p: RegularPolygon(Point2D(0, 0), 5, 8, 0)

perimeter= 40\*sqrt(2 - sqrt(2))

area= (400 - 200\*sqrt(2))/(-4 + 4\*sqrt(2))

35: