Worksheet: Equation of a Circle

Q1: Write, in the form $ax^2 + by^2 + cx + dy + e = 0$, the equation of the circle of radius 10 and center $(4, -7)$.

Question Video

A $x^2 + y^2 - 4x + 7y + 165 = 0$

B $x^2 + y^2 + 4x - 7y + 165 = 0$

C $x^2 + y^2 - 8x + 14y - 35 = 0$

D $x^2 + y^2 + 8x - 14y - 35 = 0$

Q2: Write, in the form $ax^2 + by^2 + cx + dy + e = 0$, the equation of the circle of radius 10 and center $(-7, -8)$.

Question Video

A $x^2 + y^2 + 7x + 8y + 213 = 0$

B $x^2 + y^2 - 7x - 8y + 213 = 0$

C $x^2 + y^2 + 14x + 16y + 13 = 0$

D $x^2 + y^2 - 14x - 16y + 13 = 0$

Q3: Write, in the form $ax^2 + by^2 + cx + dy + e = 0$, the equation of the circle of radius 9 and center $(8, -6)$.

Question Video

A $x^2 + y^2 - 8x + 6y + 181 = 0$

B $x^2 + y^2 + 8x - 6y + 181 = 0$

C $x^2 + y^2 - 16x + 12y + 19 = 0$

D $x^2 + y^2 + 16x - 12y + 19 = 0$

Q4: Write the equation of the circle of centre $(0, 5)$ and diameter 10.

Question Video

A $x^2 + (y + 5)^2 = 25$

B $x + (y + 5) = 5$

C $x + (y - 5) = 5$

D $x^2 + (y - 5)^2 = 25$

Q5: Give the general form of the equation of the circle centre $(8, -2)$ and diameter 10.

Question Video

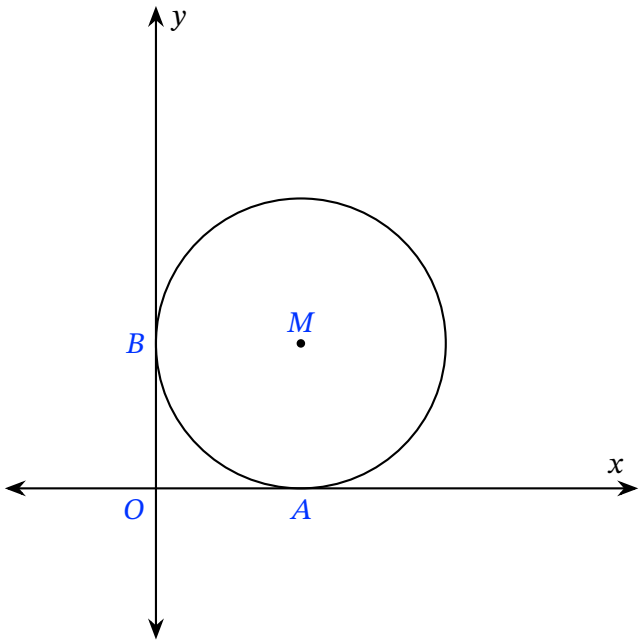
A $x^2 + y^2 - 16x + 4y + 43 = 0$

B $x^2 + y^2 - 16x + 4y - 32 = 0$

C $x^2 + y^2 + 16x - 4y - 32 = 0$

D $x^2 + y^2 + 16x - 4y + 43 = 0$

Q6: Find the general form of the equation of circle M, given that it touches the two coordinate axes at A and B and that $MO = 6\sqrt{2}$.



A $x^2 + y^2 - 12x - 12y + 36 = 0$

B $x^2 + y^2 - 6x - 6y + 36 = 0$

C $x^2 + y^2 + 12x + 12y = 0$

D $x^2 + y^2 - 12x - 12y = 0$

Q7: Write the equation of the circle of center $(8, 4)$ and radius 9.

Question Video

A $(x - 8)^2 + (y - 4)^2 = 81$

B $(x + 8)^2 + (y + 4)^2 = 81$

C $(x - 8) + (y - 4) = 9$

D $(x + 8) + (y + 4) = 9$

Q8: Determine the equation of a circle with radius $= 17$ cm, given that it touches the y-axis at the point $(0, -7)$, and its centre lies in the third quadrant.

A $(x + 7)^2 + y^2 = 289$

B $(x + 17)^2 + (y + 7)^2 = 289$

C $(x - 17)^2 + (y - 7)^2 = 289$

D $x^2 + (y + 7)^2 = 289$

Q9: What is the equation of the circle of radius 24 that lies in the third quadrant and is tangent to the two axes?

Question Video

A $x^2 + y^2 - 48x - 48y + 576 = 0$

B $x^2 + y^2 + 48x + 48y + 576 = 0$

C $x^2 + y^2 + 24x + 24y + 576 = 0$

D $x^2 + y^2 - 48x + 48y + 576 = 0$

Q10: Find the point of intersection between the line with equation $y = \frac{12}{5}x - 26$ and the circle with center $(-2, 3)$ and radius 13.

A $(25, 34)$

B $(3, -9)$

C $(10, -2)$

D $(11, 3)$

E $(-2, -10)$

Q11: Let us consider a circle of radius 4 and center $(2, -7)$.

- Write the equation of the circle.

A $(x-2)^2 + (y+7)^2 = 4$

B $(x+2)^2 + (y-7)^2 = 16$

C $(x-2)^2 + (y+7)^2 = 16$

D $(x+2)^2 + (y-7)^2 = 4$

E $(x-2)^2 + (y-7)^2 = 16$

The circle is dilated by a factor of 2. The center of dilation is the center of the circle. Write the equation of the circle.

A $(x-2)^2+(y+7)^2=32$

B $(x+2)^2+(y-7)^2=64$

C $(x-2)^2+(y+7)^2=64$

D $(x-2)^2+(y+7)^2=8$

E $(x+2)^2+(y-7)^2=32$

Q12: Let us consider a circle of radius 6 and center $(-2,-5)$.

Write the equation of the circle.

A $(x-2)^2+(y-5)^2=6$

B $(x+2)^2+(y+5)^2=36$

C $(x-2)^2+(y-5)^2=36$

D $(x+2)^2+(y+5)^2=6$

The circle is dilated by a factor of $\frac{1}{3}$. The center of dilation is the center of the circle. Write the equation of the circle.

A $(x-2)^2+(y-5)^2=12$

B $(x+2)^2+(y+5)^2=4$

C $(x+2)^2+(y+5)^2=12$

D $(x+2)^2+(y+5)^2=2$

E $(x-2)^2+(y-5)^2=4$

Q13: A circle is tangent to the x-axis at $(8,0)$ and cuts a chord of length $2\sqrt{377}$ on the negative$y$-axis. What is the equation of the circle?

A $x^2+y^2-16x+42y+64=0$

B $x^2+y^2-16x+42y-1{,}003=0$

C $x^2+y^2-16x+42y+128=0$

D $x^2+y^2-16x+42y+441=0$

Q14: A circle of radius 15 length units has its centre M at the point $(-6, -9)$. Given that the circle intersects the x-axis at points A and B, determine the area of $\triangle MAB$.

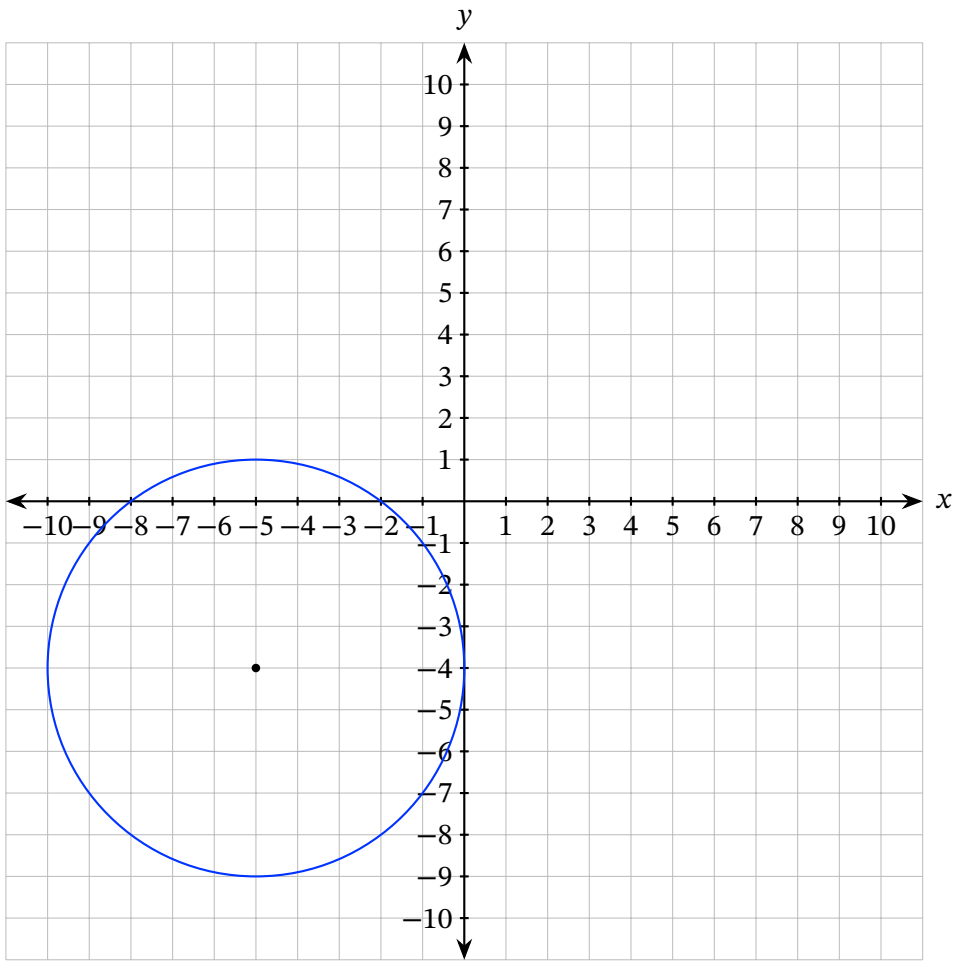
A 48 area units

B 108 area units

C 72 area units

D 120 area units

Q15: In the figure below, find the equation of the circle.



A $(x+5)^2+(y+4)^2=25$

B $(x+5)^2+(y+4)^2=5$

C $(x-5)^2+(y-4)^2=5$

D $(x-5)^2+(y-4)^2=25$

Q16: Given $A(10, 9)$ and $B(10, -1)$, find the equation of the circle with diameter $\overline{AB}$.

A $x^2 + y^2 - 20x + 2y + 76 = 0$

B $x^2 + y^2 - 20x - 8y + 91 = 0$

C $x^2 + y^2 - 20x - 18y + 156 = 0$

D $x^2 + y^2 - 20x - 8y + 16 = 0$

Q17: Let us consider a circle of radius 5 and center $(4, -8)$.

- Write the equation of the circle.

A $(x + 4)^2 + (y - 8)^2 = 5$

B $(x - 4)^2 + (y + 8)^2 = \sqrt{5}$

C $(x - 4)^2 + (y + 8)^2 = 25$

D $(x - 4)^2 + (y + 8)^2 = 5$

E $(x + 4)^2 + (y - 8)^2 = 25$

The circle undergoes a dilation by a scale factor of three, centered at $(4, -8)$, and then a translation six units to the left and three units up. Write the equation of the circle.

A $(x+2)^2+(y+5)^2=75$

B $(x+2)^2+(y+5)^2=15$

C $(x+2)^2+(y+5)^2=225$

D $(x-10)^2+(y+11)^2=225$

E $(x-10)^2+(y+11)^2=75$

Q18: Determine the equation of a circle with a diameter of 14 feet whose center was translated 15 feet left and 14 feet up from the origin.

A $(x-15)^2+(y+14)^2=49$

B $(x+15)^2+(y-14)^2=196$

C $(x-15)^2+(y-14)^2=49$

D $(x+15)^2+(y-14)^2=49$

E $(x-15)^2+(y+14)^2=196$

Q19: Find the equation of a circle which has the radius as the circle $x^2 + y^2 + 18x\cos\theta + 18y\sin\theta + 17 = 0$, and two of whose diameters lie on lines $9x + 4y + 50 = 0$ and $\mathbf{r} = \langle -4, -1\rangle + s\langle 1, -1\rangle$.

A $(x+1)^2 + (y-6)^2 = 17$

B $(x-6)^2 + (y+1)^2 = 64$

C $(x+4)^2 + (y+1)^2 = 17$

D $(x+6)^2 + (y-1)^2 = 64$

Q20: Determine the general form of the equation of the circle that passes through the two points $A(-7, 1)$ and $B(0, 6)$, given that the circle's centre lies on the straight line $6x - y = -43$.

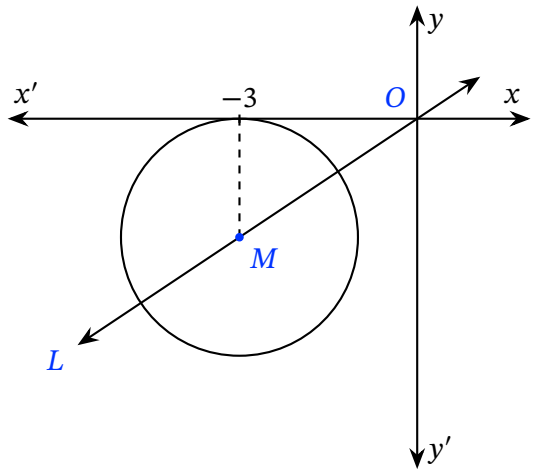
A $x^2 + y^2 + 12x - 14y + 48 = 0$

B $x^2 + y^2 - 12y - 38 = 0$

C $x^2 + y^2 + 14x - 2y + 13 = 0$

D $x^2 + y^2 - 12y - 1 = 0$

Q21: Find the general form of the equation of the circle M if the straight line L of equation $2x - 3y = 0$ passes through the centre of the circle and the origin.



A $x^2 + y^2 + 6x + 4y + 9 = 0$

B $x^2 + y^2 - 4x - 6y + 4 = 0$

C $x^2 + y^2 + 4x + 6y + 9 = 0$

D $x^2 + y^2 + 6x + 4y + 4 = 0$

Q22: A circle M has circumference 26π and intersects the x-axis at points $(-19, 0)$ and $(5, 0)$. What are the possible equations for M?

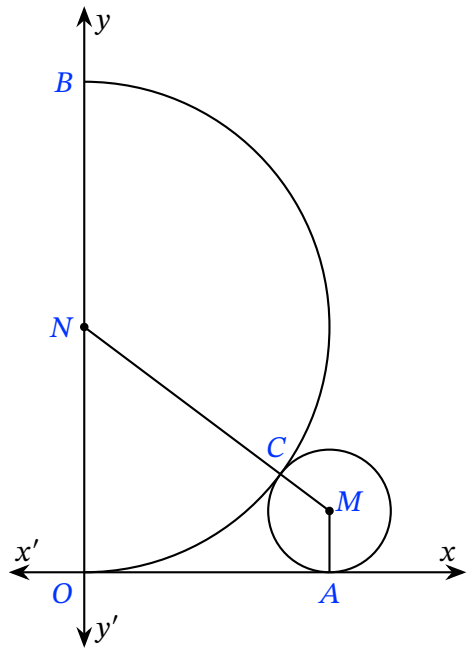
A $(x-7)^2 + (y-5)^2 = 169, (x-7)^2 + (y+5)^2 = 169$

B $(x-7)^2 + (y-5)^2 = 13, (x-7)^2 + (y+5)^2 = 13$

C $(x+7)^2 + (y+5)^2 = 13, (x+7)^2 + (y-5)^2 = 13$

D $(x+7)^2 + (y+5)^2 = 169, (x+7)^2 + (y-5)^2 = 169$

Q23: In the figure below, we are given that $A(9,0)$ and $B(0,18)$. Determine the equation of the circle at M.



A $x^2 + y^2 - 18x - 9y + 81 = 0$

B $x^2 + y^2 - 18x - \frac{9}{2}y + 81 = 0$

C $x^2 + y^2 + 18x + \frac{9}{2}y + 81 = 0$

D $x^2 + y^2 + 18x + 9y + 81 = 0$