1.	What is the remainder of $f(x) = 4x^2 - 10$ when divided by $(x - 3)$?
2.	Consider the polynomial function. $$p(x) = (x^2 - 9)(x + 5)(x - 5)$$ What are the zeros of the polynomial function?
3.	Write an expression that represents the complete factorization of $x^3 + 2x^2 - 16x - 32$.
4.	The x-intercepts of a quadratic function are $(-8, 0)$ and $(4, 0)$. Write a function in factored form that *could* be the equation of the quadratic function.
5.	What is the remainder when the polynomial $p(x) = 2x^3 + 3x^2 + 15$ is divided by $(x + 4)$?
6.	Write a polynomial function in factored form that has zeros of $x = -9, -7, and\ 12$.

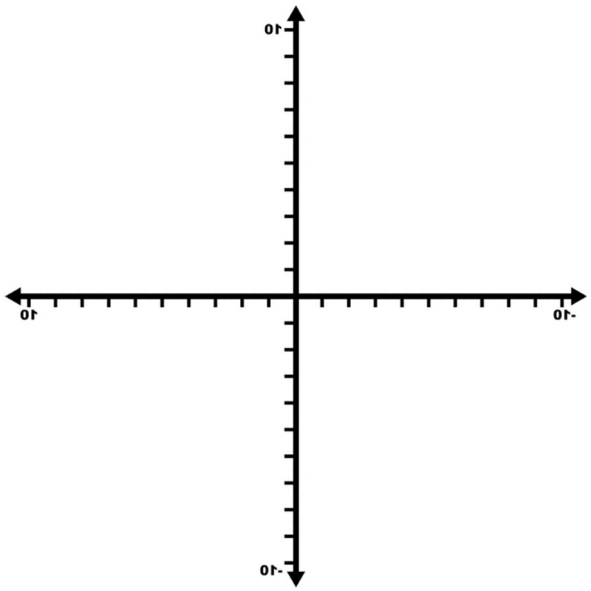
7.	In order to solve the equation $x^3 - 27 = 3(x - 1)$, a student graphs the equations $y = x^3 - 27$ and $y = 3(x - 1)$. What is the solution to the equation $x^3 - 27 = 3(x - 1)$?
8.	In order to solve the equation $2\|x + 2\| - 5 = \frac{1}{3}x + 3$, a student graphs the equations $y = 2\|x + 2\| - 5$ and $y = \frac{1}{3}x + 3$. What are the solutions to the equation $2\|x + 2\| - 5 = \frac{1}{3}x + 3$?
9.	The expression $10(2)^{5x-20}$ is rewritten as $10(k)^{x-4}$. What is the value of k?
10.	When $x \neq 3$, what value of x satisfies the equation $\frac{x+5}{x-3} = \frac{8}{x-3}$?
11.	Consider the quadratic function. $$f(x) = x^2 - 5x - 24$$ Write the quadratic function in factored form *and* list its zeros.

12. Solve the radical equation. Identify extraneous solutions, if they exist.

$$\sqrt{7x + 12} = -5$$

13. Sketch a polynomial function, $f(x)$, with the given properties.

- $f(x)$ has a zero with multiplicity 3 at $x = 4$.
- $f(x)$ has a zero with multiplicity 2 at $x = -2$.
- $f(x)$ has a y-intercept at $(0, 4)$.
- $f(x)$ has a negative leading coefficient.



14. For a certain polynomial function, a student finds that $f(5) = -5$, and $f(x)$ is evenly divisible by $(x + 5)$. Which statement must be true?

A. The values $x = -5$ and $x = 5$ are both zeros of $f(x)$.
B. The expressions $(x - 5)$ and $(x + 5)$ are both factors of $f(x)$.
C. The remainder when dividing $f(x)$ by $(x - 5)$ is 0.
D. The remainder when dividing $f(x)$ by $(x + 5)$ is 0.

15. Consider the table of values for the functions $f(x)$ and $g(x)$.

x	$f(x)$	$g(x)$
-4	-2	-0.5
-3	-3	0
-2	-4	1
-1	4	2
0	8	7

Between which two x-values does $f(x) = g(x)$ have a solution?

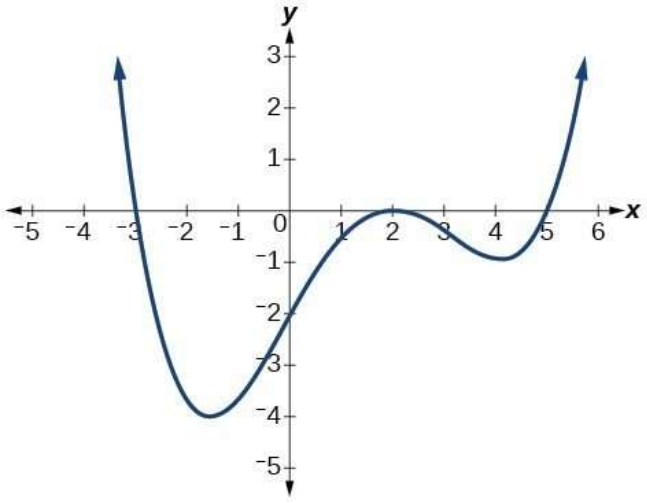
16. The expression $(4x^2 + 6x + 9)$ is a factor of $(m^3 - p^3)$. What are the values of m and p?

17. Solve the radical equation. Identify extraneous solutions, if they exist.

$$\sqrt{20 - 7x} = -12$$

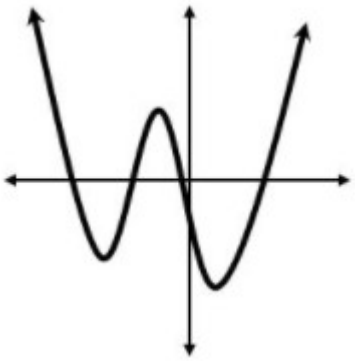
18. The expression $2(3)^{3x-9}$ is rewritten as $2(r)^{x-3}$. What is the value of r.

19. Consider the graph of the function.



What zeros are used to construct the graph of the function?

20. Consider the graph of a polynomial function, $f(x)$, with x-intercepts at $(-9, 0), (-5, 0), (-1, 0)\ and\ (4, 0)$ and a y-intercept at $(0, -2)$.



What is the degree of the polynomial?

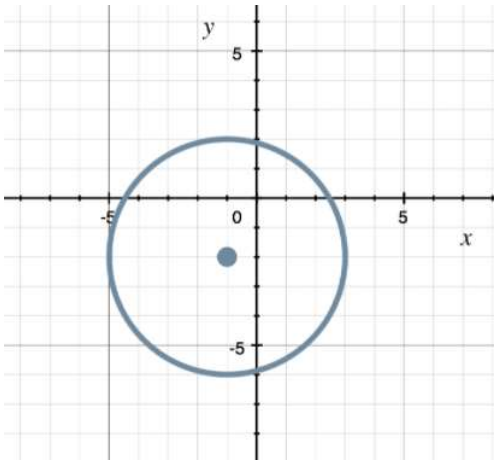
Write the factored form of $f(x)$.

21. Consider the equation of a circle.

$$(x + 7)^2 + (y - 1)^2 = 121$$

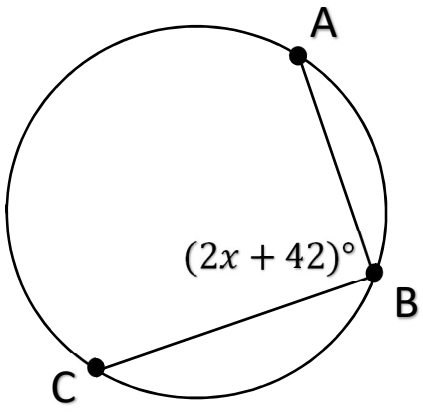
Identify the center and the radius of the circle.

22. Consider the graph of the circle.



What is the equation of the circle?

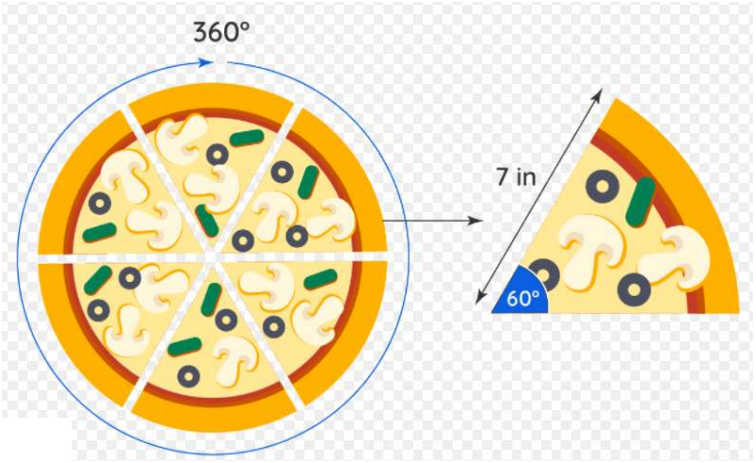
23. Consider the circle.



If points A and C are the endpoints of a diameter on the circle, what is the value of x?

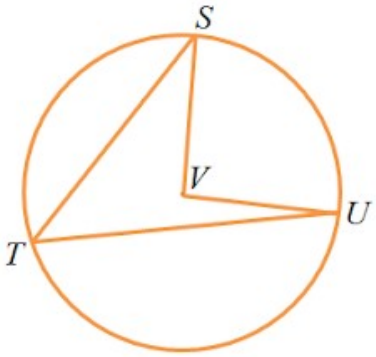
24. What is the solution to $10 = 5e^{0.041t}$? Leave your answer in terms of the natural log (solve for t but leave ln in your answer).

25. A student will win a slice of pizza IF he can correctly determine the area of it.



What is the area of a single slice of pizza? Round to two decimal places.

26. Consider Circle O.



If the measure of $\angle SVU = 110°$, what is the measure of $\angle STU$?

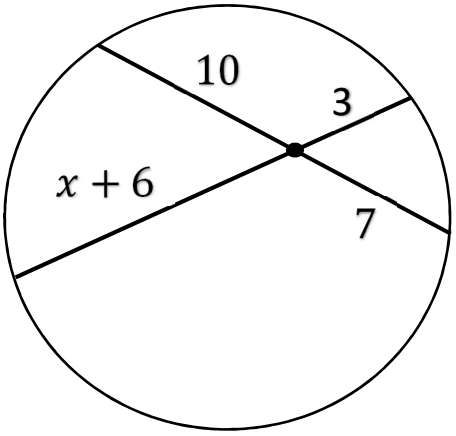
27. What is the value of h in the equation $7^{5h} = 871$, to the nearest hundredth?

28. Solve the radical equation.

$$5\sqrt[4]{x+4} - 9 = 1$$

29.	Solve the radical equation. $$x + 5 = \sqrt{2x + 10}$$
30.	Given that $x \neq \frac{7}{2}$ and $x \neq -\frac{2}{3}$, solve for x in the following equation. $$\frac{12}{2x - 7} = \frac{-3}{3x - 2}$$
31.	Josie deposits $1575 into a savings account. The account has an interest rate of 4.25%, compounded monthly. How much money will Josie have in her account after 8 years?
32.	The number of bacteria in a petri dish given by $B(x) = 1250(1.35)^x$, where x represents the number of hours. A. Determine the percent rate of change for the number of bacteria per hour. B. Does this represent an increase or a decrease in the number of bacteria per hour?
33.	In 2015, the population of the Nashville Metro Area was approximately 1,804,670. If the annual rate of growth is about 2.25% (continuous), give an approximation of the Metro Area population in 2030?

34. Consider the circle below with intersecting chords.



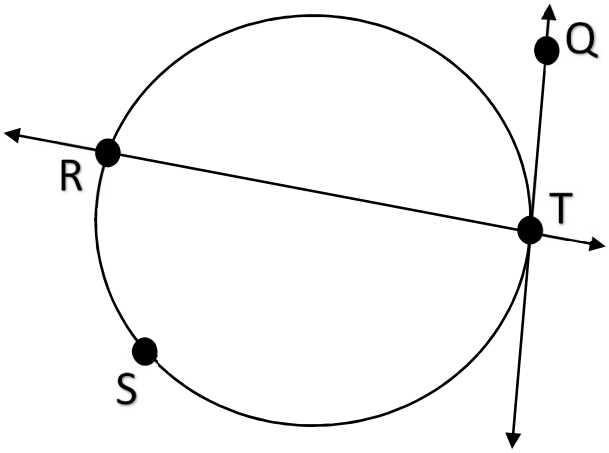
Determine the value of x. Round to one decimal place.

35. Solve the logarithmic equation. Round to two decimal places.

$$\log_7(8x - 12) = 2$$

36. Consider the circle below where line QT is tangent to the circle and line TR is a secant line.

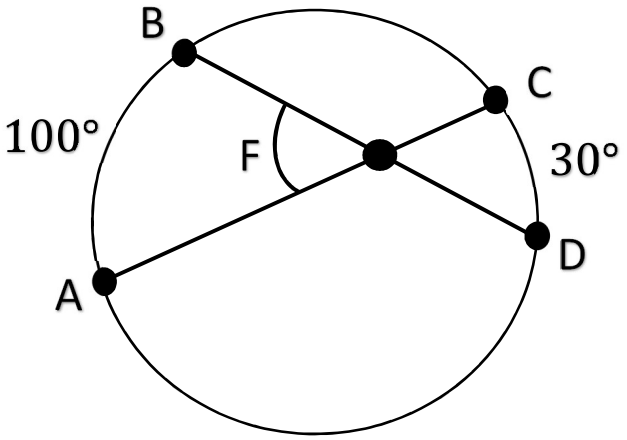
If the measure of $\angle QTR = 88°$, what is the measure of *arc* RST?



37. Write the equation of a circle with a center at $(-2, 8)$ and passes through $(4, -4)$.

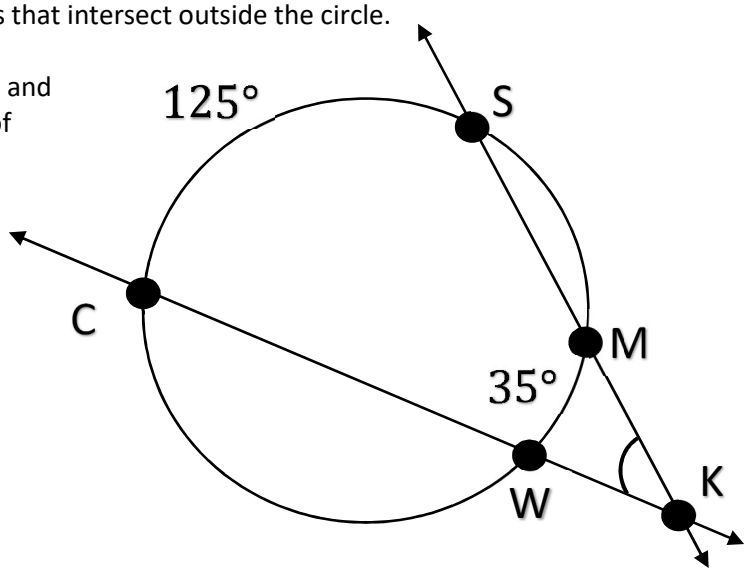
38. Consider the circle below with intersecting chords.

Given that the measure of $arc\ AB = 100°$ and $arc\ CD = 30°$, determine the measure of $\angle AFB$.



39. Consider the circle below with secant lines that intersect outside the circle.

Given that the measure of $arc\ SC = 125°$ and $arc\ WM = 35°$, determine the measure of $\angle SKC$.



40. Consider the polynomial.

$$h(x) = x^3 + 3x^2 - 64x - 192$$

Which of the following binomials **is not** a factor of $h(x)$?

A. $(x - 8)$
B. $(x - 3)$
C. $(x + 3)$
D. $(x + 8)$