

5A

1. Solve.

$$|x| = 1$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

☐ A. $x =$

(Simplify your answer. Type an integer or a fraction. Use a comma to separate answers as needed.)

☐ B. The solution set is the empty set.

2. Solve.

$$|x| = -15.9$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

☐ A. The solution is .

(Use a comma to separate answers as needed.)

☐ B. There is no solution.

3. Solve.

$$30 - |8x - 3| = 4$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

☐ A. The solution(s) is/are .

(Simplify your answer. Type an integer or a fraction. Use a comma to separate answers as needed.)

☐ B. There is no solution.

4.

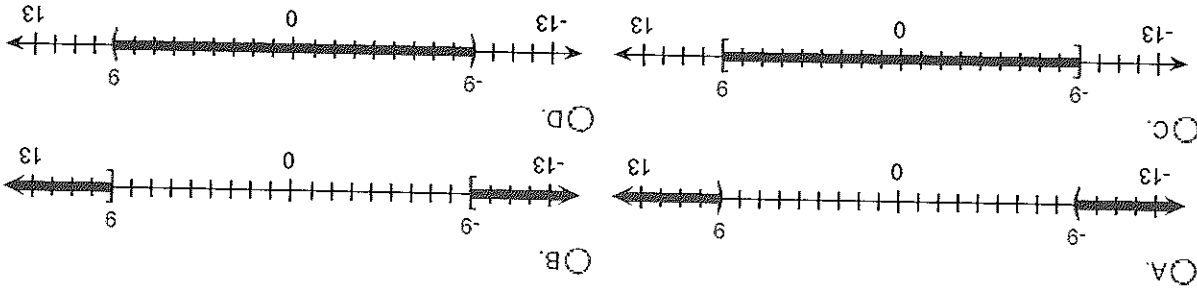
Solve the inequality. Then graph the solution set.

$$|x| \leq 9$$

Select the correct choice below and fill in any answer boxes present in your choice.

- ☐ A. The solution is .
- (Type your answer in interval notation. Simplify your answer. Use integers or fractions for any numbers in the expression.)
- ☐ B. There is no solution.

Choose the correct graph below.



5.

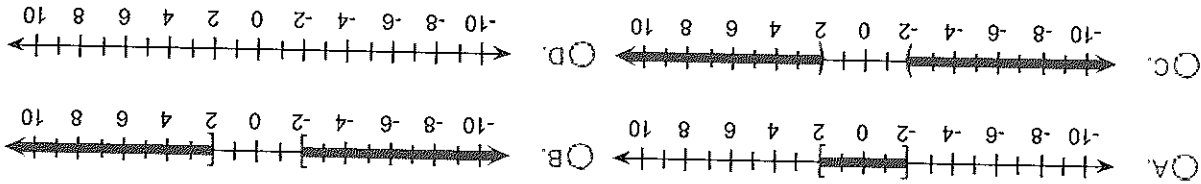
Solve the following inequality, then graph it.

$$|5x| \geq 10$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A. The solution is .
- (Type your answer in interval notation. Simplify your answer.)
- ☐ B. There is no solution.

Choose the correct graph below.



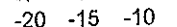
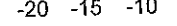
6. Solve the following inequality and write interval notation for the solution set. Then graph the solution set.

$$|4x - 5| \leq 12$$

Select the correct choice below and, if necessary, fill in the answer boxes to complete your choice.

- ☐ A. The solution set is $\boxed{}\boxed{}$.
(Simplify your answers.)
- ☐ B. There is no solution.

Choose the correct graph below.

- ☐ A. 
- ☐ B. 
- ☐ C. 
- ☐ D. 

7.

Give the solution in both interval and graph form.

$$|x - 3| > 3.3$$

Select the correct choice below and fill in any answer boxes in your choice.

- ☐ A. The solution set is $\boxed{}$.
(Type your answer in interval notation. Use integers or decimals for any numbers in the expression.)
- ☐ B. There is no solution.

Choose the correct graph of the solution set.

- Choose the correct graph.
- ☐ A. 
- ☐ B. 
- ☐ C. 
- ☐ D. 

8.

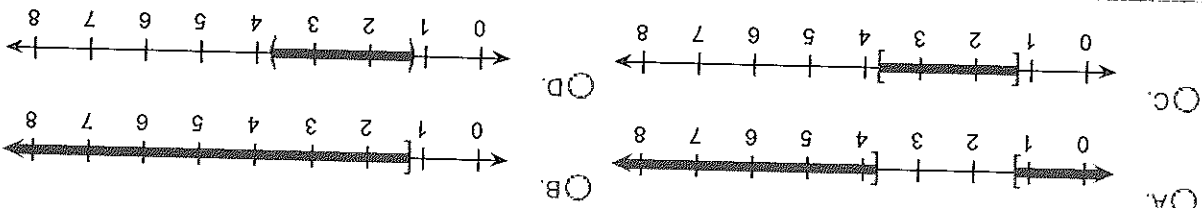
Solve the following inequality and graph the solution set.

$$|10 - 4x| \leq 5$$

The solution set is .

(Simplify your answer. Type your answer in interval notation.)

Choose the correct graph of the solution set.



9.

Solve.

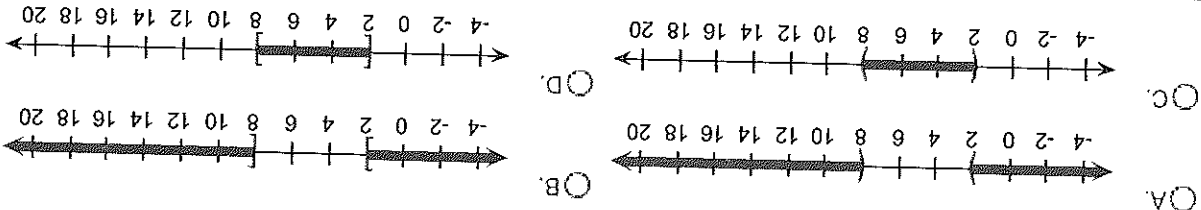
$$\left| \frac{x - 5}{3} \right| > 1$$

Select the correct choice below and fill in any answer boxes in your choice.

☐ A. The solution is .

☐ B. There is no solution.
(Type your answer in interval notation. Simplify your answer.)

Choose the graph of the solution set.



10. Determine the leading term, the leading coefficient, and the degree of the polynomial. Then classify the polynomial as constant, linear, quadratic, cubic, or quartic.

$$g(x) = -\frac{1}{6}x^2 - 5x + 4$$

The leading term of the polynomial is .

(Use integers or fractions for any numbers in the expression.)

The leading coefficient of the polynomial is .

(Type an integer or a fraction.)

The degree of the polynomial is .

The polynomial is

linear
quadratic
constant
quartic
cubic

11. Determine the leading term, the leading coefficient, and the degree of the polynomial. Then classify the polynomial as constant, linear, quadratic, cubic, or quartic.

$$h(x) = -5x^2 + 8x^3 + x^4$$

The leading term of the polynomial is .

The leading coefficient of the polynomial is .

The degree of the polynomial is .

The polynomial is

cubic
quartic
quadratic
linear
constant

12.

Describe the end behavior of the given function.

$$P(x) = -\sqrt{7}x^3 + 4x^2 - 4x + 3$$

What is the end behavior?

- ☐ A) 
☐ B) 
☐ C) 
☐ D) 

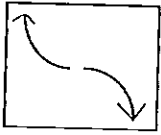
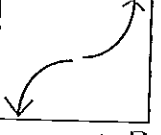
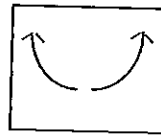
☐ (Type A, B, C, or D.)

13.

Choose the end behavior diagram that best describes the function.

$$P(x) = 2.68x^4 - 3x^2 + 5x + 2$$

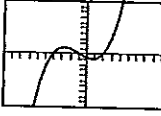
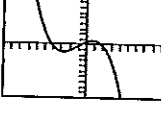
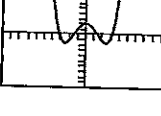
Choose from the graphs on the right.

- ☐ A. 
☐ B. 
☐ C. 
☐ D. 

14.

$$\text{Graph } y = x^3 - 3x^2 - 6x + 6.$$

Choose the correct graph.

- ☐ A. 
☐ B. 
☐ C. 

$X_{\text{scl}} = 1$ $Y_{\text{scl}} = 10$

15.

Use substitution to determine whether 4 is a zero of the following.

$$f(x) = x^3 - 9x^2 + 13x + 28$$

Is 4 a zero of $f(x)$?

- ☐ Yes
☐ No

16. Find the zeros of the polynomial function and state the multiplicity of each.

$$f(x) = (x^2 - 16)^3$$

Choose the zeros below.

- ☐ A. ± 16 , each of multiplicity 6 ☐ B. ± 4 , each of multiplicity 3
☐ C. ± 16 , each of multiplicity 3 ☐ D. ± 4 , each of multiplicity 6

17. Find the zeros of the polynomial function and state the multiplicity of each.

$$f(x) = -8(x - 4)^3(x + 5)^2x^4$$

The zero 4 has multiplicity .

is a zero of multiplicity 2.

The remaining zero is . It has multiplicity .

18. The number of bald eagles in a state during the winters from 1996 to 2002 can be modeled by the quartic function

$$f(x) = -3.347x^4 + 35.253x^3 - 97.319x^2 + 41.424x + 175.779$$

where x is the number of years since 1996. Find the number of bald eagles in the state in the winter of 2000.

The number of bald eagles in the state in the winter of 2000 is .

(Round to the nearest whole number.)

19. For the function $f(x)$, find the maximum number of real zeros, the maximum number of x -intercepts, and the maximum number of turning points that the function can have.

$$f(x) = x^5 - x^2 + 7$$

$f(x)$ has a maximum of real zeros.

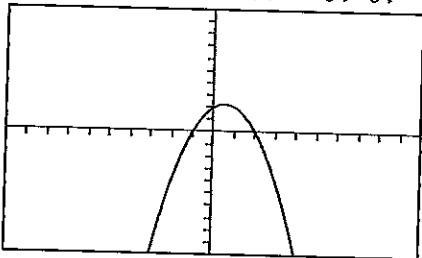
$f(x)$ has a maximum of x -intercepts.

$f(x)$ has a maximum of turning points.

20.

Consider the graph, and associate it with the appropriate function.

- Choose the correct function.
- ☐ A. $f(x) = x^3 + x^2 - 2x$
 - ☐ B. $f(x) = -x^4 - x^2 + 2$
 - ☐ C. $f(x) = x^2 + x - 2$



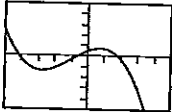
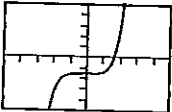
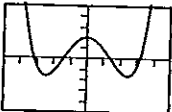
$[-10, 10, -10, 10]$ with $X_{\text{sc1}}=1$ $Y_{\text{sc1}}=1$

21.

Use the leading-term test and your knowledge of y-intercepts to match the function with one of the graphs.

$$f(x) = x^5 - x^4 + x^2 + 15$$

Choose the correct graph.

- ☐ A. 
- ☐ B. 
- ☐ C. 

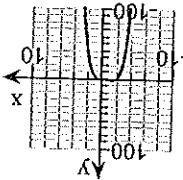
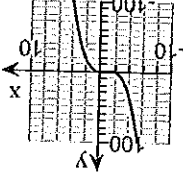
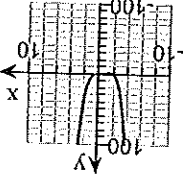
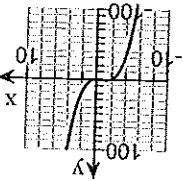
All graphs $[-5, 5, -50, 50]$ with $X_{\text{sc1}} = 1$ $Y_{\text{sc1}} = 10$

22.

Sketch the graph of the polynomial function.

$$f(x) = -x^4 - 2x^3$$

Choose the correct graph below.

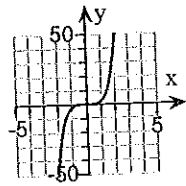
- ☐ A. 
- ☐ B. 
- ☐ C. 
- ☐ D. 

23. Sketch the graph of the polynomial function.

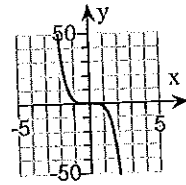
$$f(x) = x^6 - x^4$$

Choose the correct graph below.

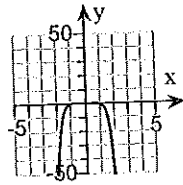
☐ A.



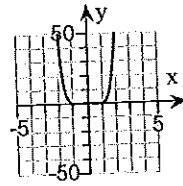
☐ B.



☐ C.



☐ D.

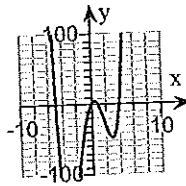


24. Sketch the graph of the polynomial function.

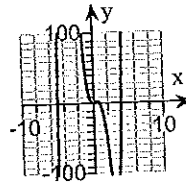
$$h(x) = x(x-1)(x+5)(x-4)$$

Choose the correct graph below.

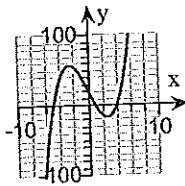
☐ A.



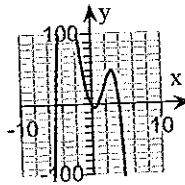
☐ B.



☐ C.



☐ D.



25. Using the Intermediate Value Theorem, show that the function f has a zero between a and b .

$$f(x) = x^3 + 4x^2 - 8x - 10 \quad a = -6, b = -5$$

What is $f(-6)$?

What is $f(-5)$?

Choose the correct statement below that explains why the given polynomial has a zero between -6 and -5 , according to the intermediate value theorem.

- ☐ A. Since $f(-6)$ and $f(-5)$ are opposite in sign, there exists at least one zero between -6 and -5 .
- ☐ B. Since $f(-5)$ is greater than $f(-6)$, the function is increasing and so there must be one real zero between -6 and -5 .

