



# Evaluation of a Polynomial in One Variable

## • Example 1

(a) Find the value of the polynomial

$$3x^3 - 2x^2 - 4x + 1$$

when  $x = 2$ .

Substituting 2 for  $x$ , we have

$$\begin{aligned} & 3 \times 2^3 - 2 \times 2^2 - 4 \times 2 + 1 \\ &= 3 \times 8 - 2 \times 4 - 4 \times 2 + 1 \\ &= 24 - 8 - 8 + 1 \\ &= 9 \end{aligned}$$

(b) Find the value of the same polynomial when  $x = -2$ .

Now we substitute  $-2$  for  $x$ .

$$\begin{aligned} & 3 \times (-2)^3 - 2 \times (-2)^2 - 4 \times (-2) + 1 \\ &= 3 \times (-8) - 2 \times 4 - 4 \times (-2) + 1 \\ &= -24 - 8 + 8 + 1 \\ &= -23 \end{aligned}$$

## • • • CHECK YOURSELF 1

Find the value of the polynomial

$$4x^3 - 3x^2 + 2x - 1$$

when

**a.**  $x = 3$

**b.**  $x = -3$

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## • • • CHECK YOURSELF ANSWER

**1.** (a) 86; (b)  $-142$ .

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# 1.4 Exercises

Name \_\_\_\_\_

Section \_\_\_\_\_

Date \_\_\_\_\_

## A N S W E R S

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

5. \_\_\_\_\_

6. \_\_\_\_\_

7. \_\_\_\_\_

8. \_\_\_\_\_

9. \_\_\_\_\_

10. \_\_\_\_\_

11. \_\_\_\_\_

12. \_\_\_\_\_

13. \_\_\_\_\_

14. \_\_\_\_\_

15. \_\_\_\_\_

16. \_\_\_\_\_

Evaluate each polynomial for the given values.

1.  $6x + 1$ ,  $x = 1$  and  $x = -1$

2.  $5x - 5$ ,  $x = 2$  and  $x = -2$

3.  $x^3 - 2x$ ,  $x = 2$  and  $x = -2$

4.  $3x^2 + 7$ ,  $x = 3$  and  $x = -3$

5.  $3x^2 + 4x - 2$ ,  $x = 4$  and  $x = -4$

6.  $2x^2 - 5x + 1$ ,  $x = 2$  and  $x = -2$

7.  $-x^2 - 2x + 3$ ,  $x = 1$  and  $x = -3$

8.  $-x^2 - 5x - 6$ ,  $x = -3$   
and  $x = -2$

Evaluate  $x^3 - 2x^2 + 5$  for the given values.

9.  $x = 1$

10.  $x = -1$

11.  $x = 3$

12.  $x = 0$

Evaluate  $2x^2 + 3$  for the given values.

13.  $x = 2$

14.  $x = -3$

15.  $x = -2$

16.  $x = 0$