

## 4.4 Extra Practice

In Exercises 1–6, factor the polynomial completely.

1.  $5t^5 - 320t^3$

2.  $2p^6 - 26p^5 + 84p^4$

3.  $3x^4 - 432x^2$

4.  $5a^6 - 16a^5 - 45a^4$

5.  $12j^9 - 28j^8 + 15j^7$

6.  $15q^{10} + 38q^9 + 24q^8$

In Exercises 7–9, factor the polynomial completely.

7.  $2p^9 - 16p^6$

8.  $25k^8 + 1600k^5$

9.  $54w^7 - 16w^4$

In Exercises 10–13, factor the polynomial completely.

10.  $x^3 - 7x^2 + 5x - 35$

11.  $m^3 - 2m^2 - 16m + 32$

12.  $9w^3 - 27w^2 - 4w + 12$

13.  $25s^3 + 100s^2 - s - 4$

In Exercises 14–16, factor the polynomial completely.

14.  $81g^4 - 625$

15.  $2t^8 + 6t^5 - 20t^2$

16.  $5v^{10} - 25v^6 + 30v^2$

In Exercises 17–20, determine whether the binomial is a factor of the polynomial function.

17.  $f(x) = 4x^3 - 15x^2 - 30x + 25$ ;  $x - 5$

18.  $f(x) = 2x^3 + 16x^2 - 4x - 50$ ;  $x + 7$

19.  $f(x) = 8x^5 + 43x^4 - 58x^3 + 60x^2 - 70$ ;  $x - 4$

20.  $f(x) = 42x^4 + 143x^3 + 37x^2 - 27x + 45$ ;  $x - 2$

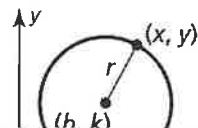
21. Fill in the blank of the divisor so that the remainder is 0. Justify your answer.

$$f(x) = 2x^3 + 7x^2 - 4x; (x + \underline{\quad})$$

22. The standard equation of a circle with radius  $r$  and center  $(h, k)$  is  $(x - h)^2 + (y - k)^2 = r^2$ .

Rewrite the equation of each circle in standard form. Identify the center and radius of the circle.

Then graph the circle.



## 4.5 Extra Practice

In Exercises 1–6, solve the equation.

1.  $4x^4 + 12x^3 + 9x^2 = 0$

2.  $6h^5 = 12h^3$

3.  $16q^4 - 8q^2 + 1 = 0$

4.  $w^4 + 81 = 18w^2$

5.  $p^3 - 25p = 50 - 2p^2$

6.  $y^3 - 8y^2 = 9y - 72$

In Exercises 7–10, find the zeros of the function. Then sketch a graph of the function.

7.  $f(x) = -5x^4 + 20x^3 + 60x^2$

8.  $g(x) = -x^3 - x^2 + 30x$

9.  $h(x) = x^3 + x^2 - 4x - 4$

10.  $f(x) = x^3 - 4x^2 - 9x + 36$

In Exercises 11 and 12, find all the real solutions of the equation.

11.  $2x^3 - 3x^2 + 18x - 27 = 0$

12.  $x^3 - 5x^2 - 2x + 24 = 0$

13. According to the Rational Root Theorem, which is *not* a possible zero of the function

$$f(x) = 24x^4 - 16x^3 + 21x - 27?$$

A.  $-\frac{3}{8}$

B.  $-2$

C.  $-\frac{1}{3}$

D.  $-\frac{9}{4}$

14. Describe and correct the error in listing the possible rational zeros of the function.

$$\times f(x) = 2x^3 + 5x^2 - 2x - 6$$

Possible zeros:  $\pm 1, \pm 2, \pm 3, \pm 6$

15. Write a third or fourth degree polynomial function that has zeros at  $\pm \frac{7}{5}$ . Justify your answer.

16. The sidewalk hazard marker is shaped like a pyramid, with a height 2 centimeters greater than the length of each side of its square base. The volume of the marker is 297 cubic centimeters. What are the dimensions of the sidewalk hazard marker?

