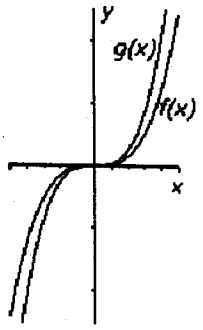
16. The figure shows the graphs of $f(x) = x^3$ and $g(x) = ax^3$. What can you conclude about the value of $a$?

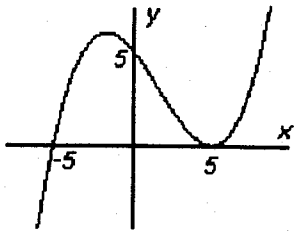



a. $a < -1$
b. $-1 < a < 0$
c. $0 < a < 1$
d. $1 < a$

17. If $f(x) = x(x + 1)(x - 4)$, use interval notation to give all values of $x$ where $f(x) > 0$.

a. $(-1, 4)$
b. $(-1, 0) \cup (4, \infty)$
c. $(-1, 4)$
d. $(0, 1) \cup (4, \infty)$

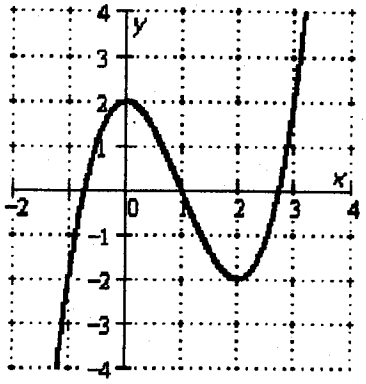
18. Find the third degree polynomial whose graph is shown in the figure.




a. $f(x) = x^3 - x^2 - x + 5$
b. $f(x) = \frac{1}{25}x^3 - \frac{1}{5}x^2 - x + 5$
c. $f(x) = \frac{1}{25}x^3 - \frac{1}{5}x^2 + 5x + 5$
d. $f(x) = \frac{1}{5}x^3 + \frac{1}{5}x^2 - x + 5$

19. The figure shows the graph of the polynomial function y = f(x).

For which of the values k = –2, 1, 2, or 3 will the equation f(x) = k have distinct real roots.




a. –2
b. 1
c. 2
d. 3

20. The degree three polynomial $f(x)$ with real coefficients and leading coefficient 1, has –3 and + 4$i$ among its roots. Express $f(x)$ as a product of linear and quadratic polynomials with real coefficients.

a. $f(x) = (x+3)(x^2 + 16)$
b. $f(x) = (x+3)(x^2 + 8x + 16)$
c. $f(x) = (x+3)(x^2 - 8x + 16)$
d. $f(x) = (x-3)(x^2 + 16)$

21. For the function $f$(x) shown in problem 1, find the domain and range of $f^{-1}(x)$.

a. Domain = [0, 6], Range [ 1, 4]
b. Domain = [0, 4], Range [ 1, 6]
c. Domain = [1, 4], Range [ 0, 6]
d. Domain = [1, 6], Range [ 0, 4]

22. From the information in the table providing values of $f(x)$ and $g(x)$, evaluate $(f \circ g)^{-1}(2)$.

| $x$ | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| $f(x)$ | 3 | 4 | 5 | 1 | 2 |
| $g(x)$ | 5 | 4 | 2 | 3 | 1 |

a. 1
b. 2
c. 4
d. 5

23. A bacteria culture started with a count of 720 at 8:00 A.M., and after $t$ hours is expected to grow to $f(t) = 720\left(\frac{3}{2}\right)^t$. Estimate the number of bacteria in the culture at 11:00 A.M. the same day.

a. 1620
b. 2160
c. 2430
d. 2880

24. If a piece of real estate purchased for \$50,000 in 1998 appreciates at the rate of 5% per year, then its value $t$ years after the purchase will be $f(t) = 50{,}000(1.05^t)$. According to this model, by how much will the value of this piece of property increase between the years 2007 and 2008?

a. \$2500
b. \$3140
c. \$3880
d. \$31,400

25. Solve $\log_a(7x+1) = \log_a(4x+16)$

a. 4
b. 5
c. 6
d. 8