



Find the inverse function of  $f$ . State the domain and range of  $f$ .

$$3) f(x) = \frac{3x - 2}{x + 5}$$

$$A) f^{-1}(x) = \frac{5x + 2}{3 + x}; \text{ domain of } f: \{x \mid x \neq -5\}; \text{ range of } f: \{y \mid y \neq -3\}$$

$$B) f^{-1}(x) = \frac{5x + 2}{3 - x}; \text{ domain of } f: \{x \mid x \neq -5\}; \text{ range of } f: \{y \mid y \neq 3\}$$

$$C) f^{-1}(x) = \frac{x + 5}{3x - 2}; \text{ domain of } f: \{x \mid x \neq -5\}; \text{ range of } f: \{y \mid y \neq \frac{2}{3}\}$$

$$D) f^{-1}(x) = \frac{5x + 2}{3 + x}; \text{ domain of } f: \{x \mid x \neq -5\}; \text{ range of } f: \{y \mid y \neq -\frac{2}{5}\}$$

Write as the sum and/or difference of logs. Express powers as factors.

$$4) \log_5 \frac{(p + w) \sqrt[7]{q}}{t^2}$$

$$A) \log_5 (p + w) + 7 \log_5 q - 2 \log_5 t$$

$$B) \log_5 p + \log_5 w + \frac{1}{7} \log_5 q - 2 \log_5 t$$

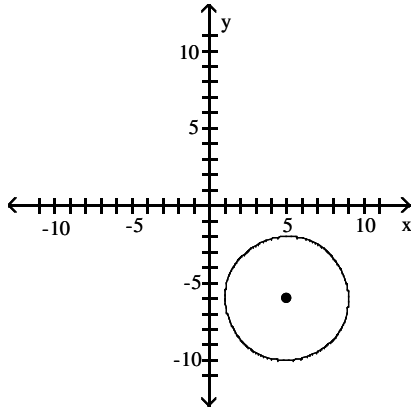
$$C) \log_5 p + \log_5 w - 7 \log_5 q - \frac{1}{2} \log_5 t$$

$$D) \log_5 (p + w) + \frac{1}{7} \log_5 q - 2 \log_5 t$$

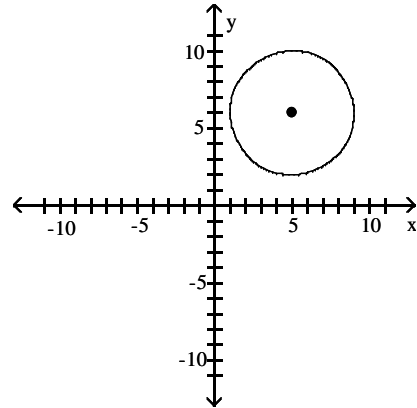
Find the center  $(h, k)$  and radius  $r$  of the circle. Graph the circle.

5)  $x^2 + y^2 + 10x + 12y + 45 = 0$

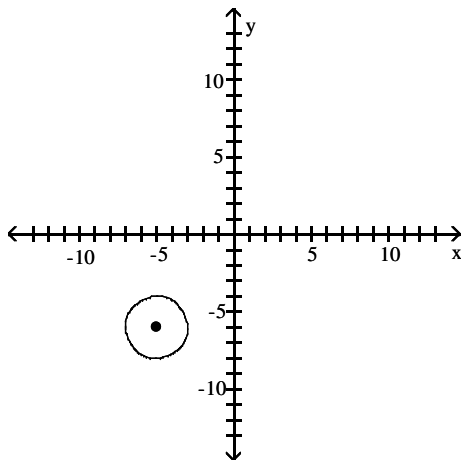
A)  $(h, k) = (5, -6); r = 4$



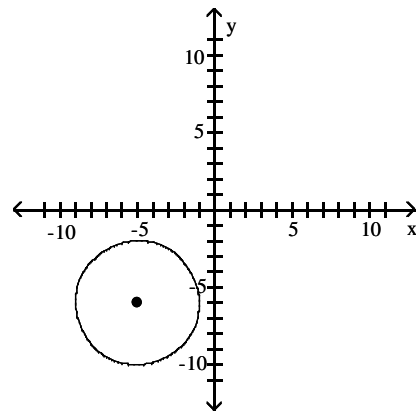
B)  $(h, k) = (5, 6); r = 4$



C)  $(h, k) = (-5, -6); r = 2$



D)  $(h, k) = (-5, -6); r = 4$



Find the first term, the common difference, and give a recursive formula for the arithmetic sequence.

6) 7th term is 59; 15th term is 43

A)  $a_1 = 73, d = -2, a_n = a_{n-1} - 2$

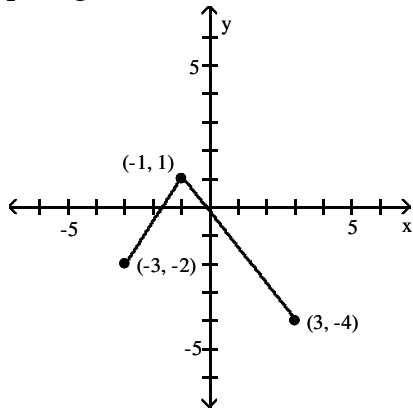
B)  $a_1 = 71, d = 2, a_n = a_{n-1} + 2$

C)  $a_1 = 73, d = 2, a_n = a_{n-1} + 2$

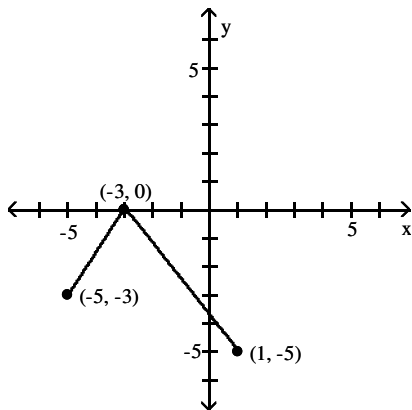
D)  $a_1 = 71, d = -2, a_n = a_{n-1} - 2$

Using transformations, sketch the graph of the requested function.

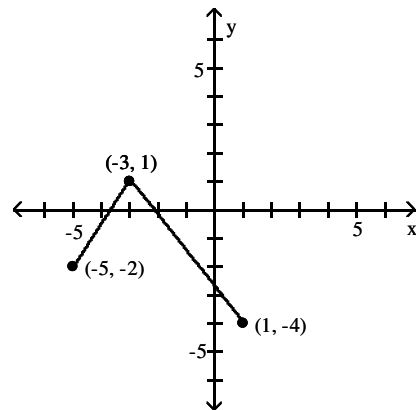
- 7) The graph of a function  $f$  is illustrated. Use the graph of  $f$  as the first step toward graphing the function  $F(x)$ , where  $F(x) = f(x + 2) - 1$ .



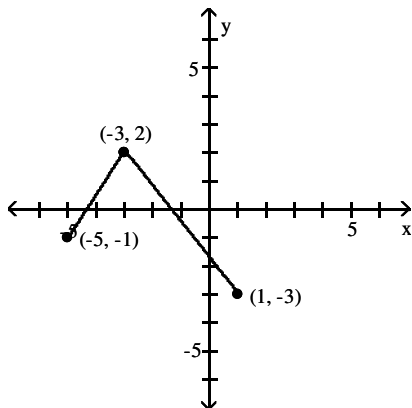
A)



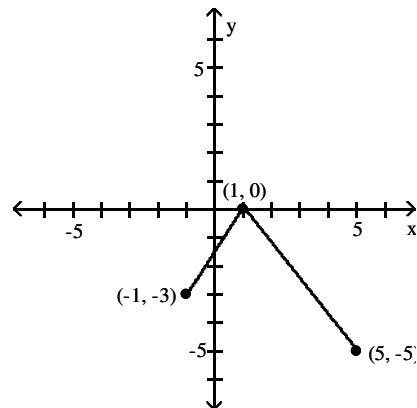
B)



C)



D)



Compute the product.

$$8) \begin{bmatrix} 0 & -3 & 1 \\ 5 & -1 & 0 \end{bmatrix} \begin{bmatrix} 1 & 2 \\ 0 & 1 \\ 1 & -1 \end{bmatrix}$$

A)

$$\begin{bmatrix} 0 & 10 \\ 0 & -1 \\ 0 & 0 \end{bmatrix}$$

B)

$$\begin{bmatrix} 1 & 5 \\ -4 & 9 \end{bmatrix}$$

C)

$$\begin{bmatrix} 10 & -5 & 1 \\ 5 & -1 & 0 \\ -5 & -2 & 0 \end{bmatrix}$$

D)

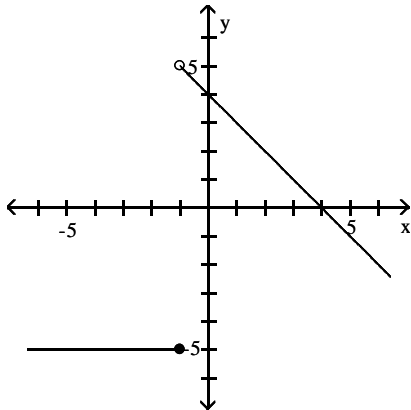
$$\begin{bmatrix} 1 & -4 \\ 5 & 9 \end{bmatrix}$$

Graph the function.

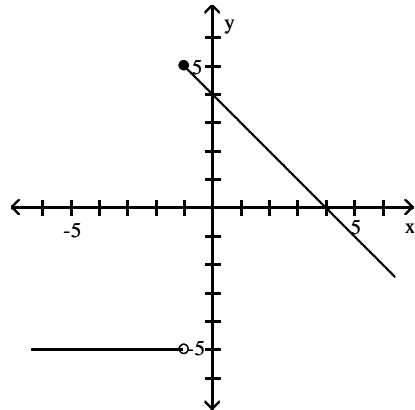
9)

$$f(x) = \begin{cases} x + 4 & \text{if } x < 1 \\ -5 & \text{if } x \geq 1 \end{cases}$$

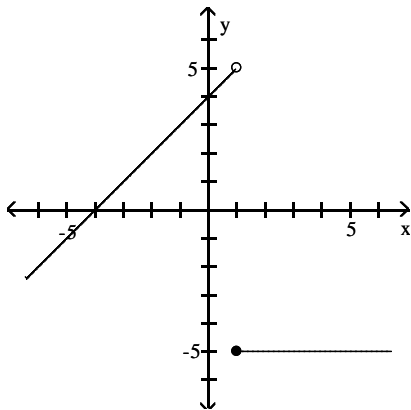
A)



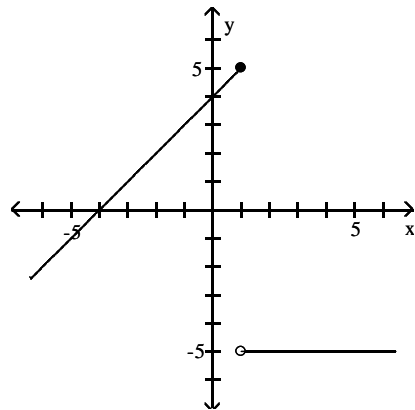
B)



C)



D)



**For the polynomial, list each real zero and its multiplicity. Determine whether the graph crosses or touches the x-axis at each x-intercept.**

10)  $f(x) = 2(x + 1)(x - 5)^4$

- A) -1, multiplicity 1, touches x-axis; 5, multiplicity 4, crosses x-axis
- B) 1, multiplicity 1, crosses x-axis; -5, multiplicity 4, touches x-axis
- C) -1, multiplicity 1, crosses x-axis; 5, multiplicity 4, touches x-axis
- D) 1, multiplicity 1, touches x-axis; -5, multiplicity 4, crosses x-axis

## Answer Key

Testname: CA-FINALAMC

- 1) D
- 2) C
- 3) B
- 4) D
- 5) D
- 6) D
- 7) A
- 8) D
- 9) C
- 10) C