

1. The equation of the line passing through the points $(5, -7)$ and $(-4, 11)$ is

A. $y = 2x - 12$

B. $y = -2x + 3$

C. $y = -2x + 17$

D. $y = 2x - 17$

E. $y = -2x - 12$

2. Find an equation of the line parallel to $y = -3x + 8$ and passing through the center of the circle $(x + 2)^2 + (y - 3)^2 = 16$

A. $y = -3x + 9$

B. $y = 3x + 5$

C. $y = 3x - 3$

D. $y = 3x - 5$

E. $y = -3x - 3$

3. Find the radius and center of the circle

$$x^2 + 6x + y^2 - 10y + 30 = 0$$

- A. Center: $(-3, 5)$, Radius: 2
 - B. Center: $(-3, 5)$, Radius: 8
 - C. Center: $(3, -5)$, Radius: 4
 - D. Center: $(3, -5)$, Radius: 2
 - E. Center: $(-3, 5)$, Radius: 4
4. Find the coordinates of the focus and the equation of the directrix for the following curve:

$$x^2 = 16y$$

- A. Focus: $(-4, 0)$, Directrix: $x = 4$
- B. Focus: $(0, -16)$, Directrix: $x = 16$
- C. Focus: $(4, 0)$, Directrix: $x = -4$
- D. Focus: $(0, 16)$, Directrix: $y = -16$
- E. Focus: $(0, 4)$, Directrix: $y = -4$

5. Find the equation of the ellipse with foci at $(\pm\sqrt{5}, 0)$ and vertices at $(\pm\sqrt{7}, 0)$.

A. $\frac{x^2}{7} + \frac{y^2}{2} = 5$

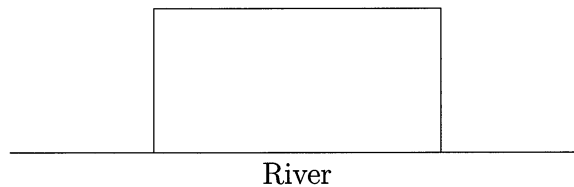
B. $\frac{x^2}{7} + \frac{y^2}{5} = 1$

C. $\frac{x^2}{7} + \frac{y^2}{2} = 1$

D. $\frac{x^2}{\sqrt{7}} + \frac{y^2}{\sqrt{5}} = 1$

E. $\frac{x^2}{2} + \frac{y^2}{7} = 1$

6. A rectangular area adjacent to a river is to be enclosed by a fence on the other three sides, as shown in the picture. The side parallel to the river is to be twice the length of the other two sides. If x is the length of the side parallel to the river, write a function of x giving the total amount of fencing used.



A. $P(x) = 4x$

B. $P(x) = 3x$

C. $P(x) = \frac{1}{2}x^2$

D. $P(x) = 2x$

E. $P(x) = 2x^2$

7. If $f(x) = 3x^2$ and $g(x) = x - 2$, then $f(g(x)) = ?$

A. $3x^2 - 12x + 12$

B. $3x^2 - 2$

C. $3x^2 - 12$

D. $3x^2 + 12x + 12$

E. $3x^3 - 6x^2$

8. If $f(x) = 5x - 3x^2$, find and simplify $\frac{f(x + \Delta x) - f(x)}{\Delta x}$

A. $5 - 6\Delta x$

B. $\frac{5\Delta x - 3(\Delta x)^2}{\Delta x}$

C. $5 - 6\Delta x + 3x$

D. $5 - 6x$

E. $5 - 6x + 3\Delta x$

9. Compute the following limit:

$$\lim_{x \rightarrow -3} \frac{x^2 + x - 6}{x + 3}$$

- A. 1
- B. 0
- C. 5
- D. -5
- E. -1

10. Compute the following limit:

$$\lim_{x \rightarrow \infty} \frac{1 - 6x^2 + 5x^3}{3x^3 - 2x + 7}$$

- A. 5
- B. -2
- C. $\frac{5}{3}$
- D. 0
- E. $\frac{1}{3}$

11. If $f(x) = \frac{1}{5}x^5 - 2x^2 + 4$, find $f'(-2)$.

A. 24

B. $-\frac{52}{5}$

C. 8

D. 28

E. 25

12. An object is dropped from a building 36 ft tall. The distance s in feet from the top t seconds later is given by $s = 16t^2$. What is its speed when it hits the ground?

A. $\frac{3}{2}$ ft/s

B. 96 ft/s

C. 48 ft/s

D. $\frac{9}{4}$ ft/s

E. 24 ft/s