

1. Solve using the zero-factor property.

$$4a(11a + 7) = 0$$

a = \_\_\_\_\_

(Type an integer or a simplified fraction. Use a comma to separate answers.)

2. Solve.

$$r^2 = 16 - 6r$$

The solutions are \_\_\_\_\_.

(Type an integer or a simplified fraction. Use a comma to separate answers.)

3. Solve the equation for c.

$$3c^2 + 26c + 48 = 0$$

c = \_\_\_\_\_

(Simplify your answer. Use a comma to separate answers as needed.)

4. Solve.

$$x^2 = 100$$

Select the correct choice below and fill in any answer boxes within your choice.

A. The solutions are  $x =$  \_\_\_\_\_ .  
(Type an integer or a simplified fraction. Use a comma to separate answers as needed.)

B. There is no real number solution.

5. Solve the equation by using the square root property. Express all radicals in simplest form.

$$t^2 = 98$$

Select the correct choice below and fill in any answer boxes within your choice.

A. The solutions are  $t =$  \_\_\_\_\_ .  
(Simplify your answer. Type an exact answer, using radicals as needed. Use a comma to separate answers as needed.)

B. There is no real number solution.

6. Solve the equation by using the square root property.

$$y^2 = \frac{49}{9}$$

Select the correct choice below and fill in any answer boxes within your choice.

A. The solutions are  $y =$  \_\_\_\_\_ .  
(Type an integer or a simplified fraction. Use a comma to separate answers as needed.)

B. There is no real number solution.

7. Solve.

$$2x^2 = 7$$

Select the correct choice below and, if necessary, fill in the answer box within your choice.

A. The solution is  $x =$  \_\_\_\_\_ .  
(Simplify your answer. Type an exact answer, using radicals as needed. Rationalize all denominators. Use a comma to separate answers as needed.)

B. There is no solution.

8. Solve.

$$(x - 22)^2 = 8$$

Select the correct choice below and fill in any answer boxes within your choice.

- A. The solutions are  $x =$   .  
(Simplify your answer. Type an exact answer, using radicals as needed. Use a comma to separate answers as needed.)
- B. There is no real number solution.

9. Solve by completing the square.

$$x^2 - 8x = -7$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solutions are  $x =$   .  
(Simplify your answers. Type an integer or a fraction. Use a comma to separate answers as needed.)
- B. There is no real solution.

10. Solve.

$$x^2 - 7x + 10 = 0$$

Select the correct choice below and fill in any answer boxes within your choice.

- A. The solutions are  $x =$   .  
(Use a comma to separate answers as needed.)
- B. There is no real number solution.

11. Use the quadratic formula to solve the equation.

$$2x^2 - 11x = 1$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solutions are  $x =$   .  
(Type exact answers, using radicals as needed. Use a comma to separate answers as needed. Use integers or fractions for any numbers in the expression.)
- B. There are no real solutions.

12. Use the quadratic formula to solve the equation.

$$7x^2 - 2x + 21 = 26x + 1$$

Choose the solutions of the equation

$$7x^2 - 2x + 21 = 26x + 1.$$

- A. No real number solution
- B.  $\frac{28 \pm \sqrt{224}}{14}$
- C.  $\frac{14 \pm \sqrt{14}}{7}$
- D.  $\frac{14 \pm 2\sqrt{14}}{7}$

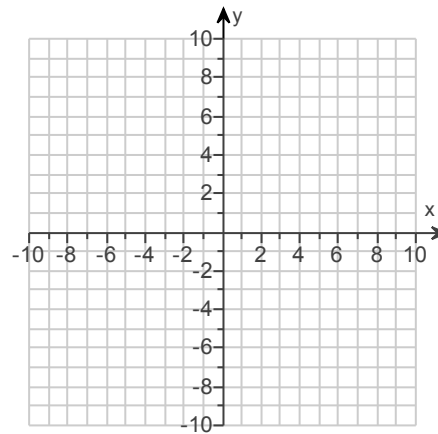
13. Give the coordinates of the vertex. Sketch the graph of the equation.

$$y = x^2 + 2x + 6$$

Use the graphing tool on the right to graph the parabola.

What is the vertex of the parabola?

\_\_\_\_\_ (Type your answer as an ordered pair.)



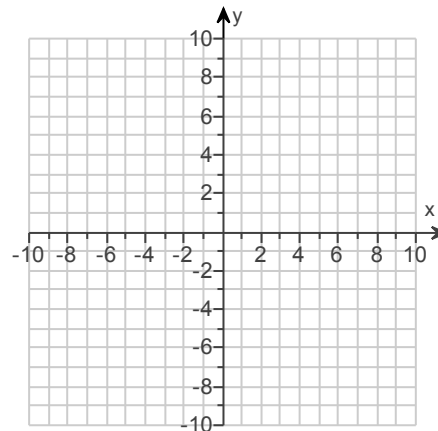
14. Sketch the graph of the parabola. Find the coordinates of the vertex.

$$y = -x^2 + 2x - 3$$

Use the graphing tool on the right to graph the parabola.

The vertex is \_\_\_\_\_.

(Type your answer as an ordered pair.)



15. Write the expression as a sum of multiples of logarithms. Assume that variables represent positive numbers.

$$\log_b \sqrt{3x}$$

$$\log_b \sqrt{3x} = \underline{\hspace{2cm}}$$

(Use integers or fractions for any numbers in the expression. Type all variables without any exponents.)

16. Solve the equation. Give an exact solution and also an approximate solution to four decimal places.

$$3^x = 7$$

a. The exact solution is  $x = \underline{\hspace{2cm}}$ .

b. The approximate solution is  $x \approx \underline{\hspace{2cm}}$ .

(Do not round until the final answer. Then round to four decimal places as needed.)

17. Solve the equation. Give an exact solution, and also approximate the solution to four decimal places.

$$5^{x-3} = 2$$

Write the exact solution.

$x = \underline{\hspace{2cm}}$  (Simplify your answer.)

The approximate solution is  $\underline{\hspace{2cm}}$ .

(Do not round until the final answer. Then round to four decimal places as needed.)

18. Solve the equation.

$$\log_5(x + 3) = 2$$

---

Select the correct choice below and fill in any answer boxes present in your choice.

- A.  $x =$    
(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)
- B. There is no solution.
- 

19. Solve the equation.

$$\log_4 6 - \log_4 x = 2$$

---

Select the correct choice below and fill in any answer boxes present in your choice.

- A.  $x =$    
(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)
- B. There is no solution.
- 

20. The point given below is on the terminal side of an angle  $\theta$ . Find the exact value of each of the six trigonometric functions of  $\theta$ .

$(-4, 3)$

---

**sin**  $\theta =$  \_\_\_\_\_ (Type an integer or a simplified fraction.)

**cos**  $\theta =$  \_\_\_\_\_ (Type an integer or a simplified fraction.)

**tan**  $\theta =$  \_\_\_\_\_ (Type an integer or a simplified fraction.)

**cot**  $\theta =$  \_\_\_\_\_ (Type an integer or a simplified fraction.)

**sec**  $\theta =$  \_\_\_\_\_ (Type an integer or a simplified fraction.)

**csc**  $\theta =$  \_\_\_\_\_ (Type an integer or a simplified fraction.)

---

21. A point on the terminal side of angle  $\theta$  is given. Find the exact value of each of the six trigonometric functions of  $\theta$ .

$$(-2, -5)$$

**sin**  $\theta$  = \_\_\_\_\_

(Simplify your answer. Type an exact answer, using radicals as needed. Use integers or fractions for any numbers in the expression. Rationalize all denominators.)

**cos**  $\theta$  = \_\_\_\_\_

(Simplify your answer. Type an exact answer, using radicals as needed. Use integers or fractions for any numbers in the expression. Rationalize all denominators.)

**tan**  $\theta$  = \_\_\_\_\_

(Simplify your answer. Type an exact answer, using radicals as needed. Use integers or fractions for any numbers in the expression. Rationalize all denominators.)

**csc**  $\theta$  = \_\_\_\_\_

(Simplify your answer. Type an exact answer, using radicals as needed. Use integers or fractions for any numbers in the expression. Rationalize all denominators.)

**sec**  $\theta$  = \_\_\_\_\_

(Simplify your answer. Type an exact answer, using radicals as needed. Use integers or fractions for any numbers in the expression. Rationalize all denominators.)

**cot**  $\theta$  = \_\_\_\_\_

(Simplify your answer. Type an exact answer, using radicals as needed. Use integers or fractions for any numbers in the expression. Rationalize all denominators.)

22. Determine the amplitude and period of each function. Then graph one period of the function.

$$y = 3 \sin \frac{1}{2}x$$

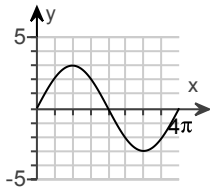
The amplitude is \_\_\_\_\_.

The period is \_\_\_\_\_.

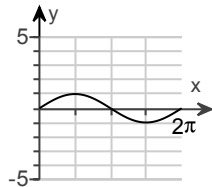
(Type an exact answer in terms of  $\pi$ . Use integers or fractions for any numbers in the expression.)

Determine the graph of  $y = 3 \sin \frac{1}{2}x$ .

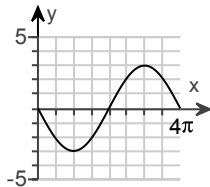
A.



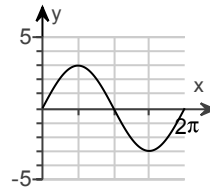
B.



C.



D.



23. Determine the amplitude, period, and phase shift of the function. Then graph one period of the function.

$$y = \sin(x - \pi)$$

The amplitude is \_\_\_\_\_.

The period is \_\_\_\_\_.

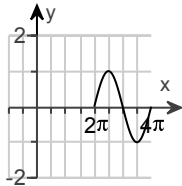
(Type an exact answer, using  $\pi$  as needed. Use integers or fractions for any numbers in the expression.)

The phase shift is \_\_\_\_\_.

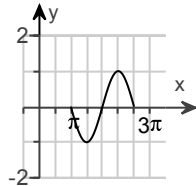
(Type an exact answer, using  $\pi$  as needed. Use integers or fractions for any numbers in the expression.)

Choose the graph of  $y = \sin(x - \pi)$ .

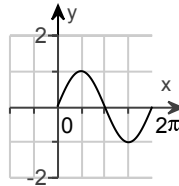
A.



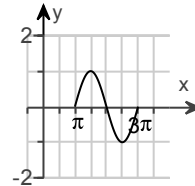
B.



C.



D.



24. Determine the amplitude and period of each function. Then graph the function and  $y = \cos x$  in the same rectangular coordinate system for  $0 \leq x \leq 2\pi$ .

$$y = -9 \cos x$$

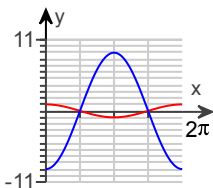
The amplitude is \_\_\_\_\_.

The period is \_\_\_\_\_.

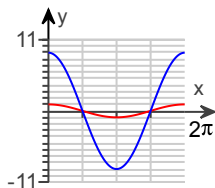
(Type an exact answer, using  $\pi$  as needed. Use integers or fractions for any numbers in the expression.)

Choose the graph that shows  $y = \cos x$  in red and  $y = -9 \cos x$  in blue.

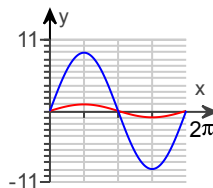
A.



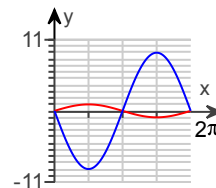
B.



C.



D.



\*25.

Find the indicated sum.

$$\sum_{i=1}^3 i(i+1)$$

$$\sum_{i=1}^3 i(i+1) = \underline{\hspace{2cm}} \text{ (Simplify your answer.)}$$

1.  $-\frac{7}{11}, 0$

---

2.  $2, -8$

---

3.  $-\frac{8}{3}, -6$

---

4. A. The solutions are  $x = \underline{10, -10}$ .  
(Type an integer or a simplified fraction. Use a comma to separate answers as needed.)

---

5. A. The solutions are  $t = \underline{-7\sqrt{2}, 7\sqrt{2}}$ .  
(Simplify your answer. Type an exact answer, using radicals as needed. Use a comma to separate answers as needed.)

---

6. A. The solutions are  $y = \underline{\frac{7}{3}, -\frac{7}{3}}$ .  
(Type an integer or a simplified fraction. Use a comma to separate answers as needed.)

---

7. A. The solution is  $x = \underline{\frac{\sqrt{14}}{2}, -\frac{\sqrt{14}}{2}}$ .  
(Simplify your answer. Type an exact answer, using radicals as needed. Rationalize all denominators. Use a comma to separate answers as needed.)

---

8. A. The solutions are  $x = \underline{22 + 2\sqrt{2}, 22 - 2\sqrt{2}}$ .  
(Simplify your answer. Type an exact answer, using radicals as needed. Use a comma to separate answers as needed.)

---

9. A. The solutions are  $x = \underline{1, 7}$ .  
(Simplify your answers. Type an integer or a fraction. Use a comma to separate answers as needed.)

---

10. A. The solutions are  $x = \underline{5, 2}$ . (Use a comma to separate answers as needed.)

---

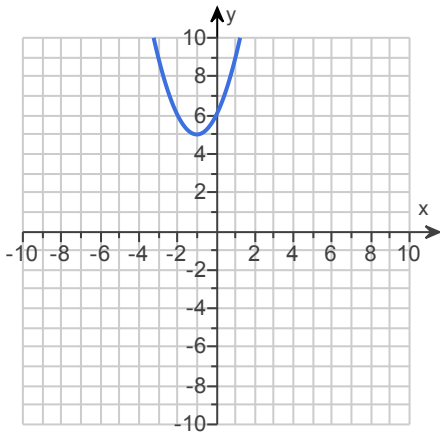
11. A. The solutions are  $x = \underline{\frac{11 + \sqrt{129}}{4}, \frac{11 - \sqrt{129}}{4}}$ .  
(Type exact answers, using radicals as needed. Use a comma to separate answers as needed. Use integers or fractions for any numbers in the expression.)

---

12. D.  $\frac{14 \pm 2\sqrt{14}}{7}$

---

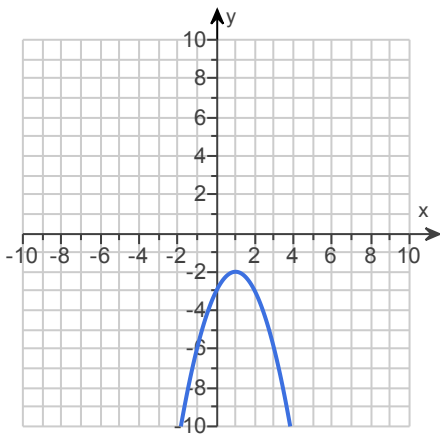
13.



(-1, 5)

---

14.



(1, -2)

---

15.  $\frac{1}{2} \log_b 3 + \frac{1}{2} \log_b x$

---

16.  $\frac{\log 7}{\log 3}$   
1.7712

---

17.  $3 + \frac{\log 2}{\log 5}$   
3.4307

---

18. A.  $x = \underline{\quad 22 \quad}$

(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

---



19. A.  $x = \frac{3}{8}$

(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

---

20.  $\frac{3}{5}$

$-\frac{4}{5}$

$-\frac{3}{4}$

$-\frac{4}{3}$

$-\frac{5}{4}$

$\frac{5}{3}$

---

21.  $-\frac{5\sqrt{29}}{29}$

$-\frac{2\sqrt{29}}{29}$

$\frac{5}{2}$

$-\frac{\sqrt{29}}{5}$

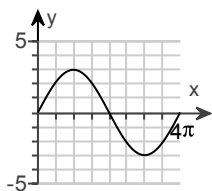
$-\frac{\sqrt{29}}{2}$

$\frac{2}{5}$

---

22. 3

$4\pi$



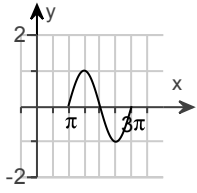
A.

---

23. 1

$2\pi$

$\pi$

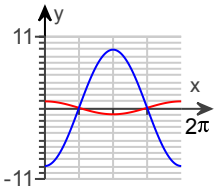


D.

---

24. 9

$2\pi$



A.

---

25. 20

---