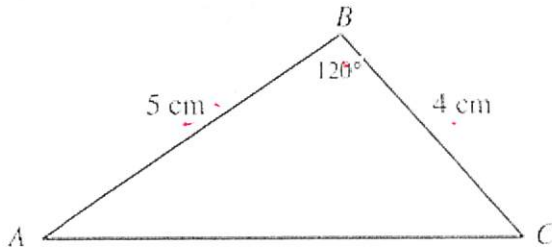


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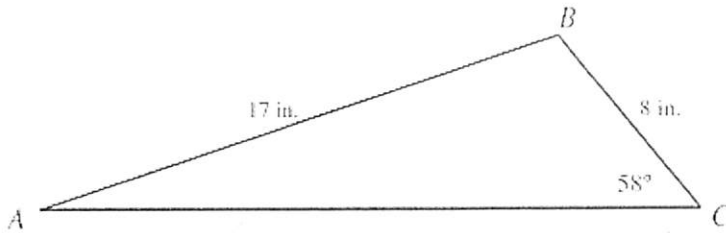
47. Find the area of $\triangle ABC$. The figure is not drawn to scale.



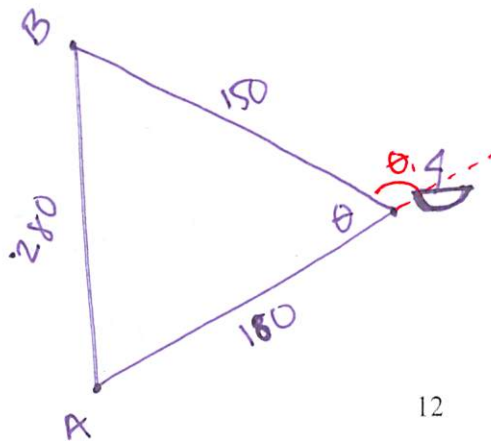
$$A = \frac{1}{2} ab \sin C$$

$$A = \frac{1}{2} (5)(4) \sin 120$$

- a. 7.33 cm^2 b. 10.0 cm^2 **c. 8.66 cm^2** d. 10.88 cm^2
48. Given triangle ABC with $b = 3$, $c = 7$, and $m\angle A = 74^\circ$, find a . Round the answer to two decimal places.
 a. 6.6 **b. 6.81** c. 8.34 d. 7.23
49. Solve $\triangle ABC$ with $A = 69^\circ$, $b = 34$, and $c = 46$.
a. $a = 46.38, B = 43.19^\circ, C = 67.81^\circ$ c. $a = 45.15, B = 41.74^\circ, C = 69.26^\circ$
 b. $a = 45.15, B = 43.19^\circ, C = 67.81^\circ$ d. $a = 46.38, B = 41.74^\circ, C = 69.26^\circ$
50. Solve the triangle for angle A . Then find its area.



- a. $A = 23.52^\circ, \text{Area} = 84.03 \text{ in.}^2$ c. $A = 32^\circ, \text{Area} = 84.03 \text{ in.}^2$
 b. $A = 32^\circ, \text{Area} = 67.26 \text{ in.}^2$ **d. $A = 23.52^\circ, \text{Area} = 67.26 \text{ in.}^2$**
51. Island A is 280 miles from island B. A ship captain travels 180 miles from island A and then finds that he is off course and 150 miles from island B. What angle, in degrees, must he turn through to head straight for island B? Round the answer to two decimal places. (Hint: Be careful to properly identify which angle is the turning angle.)
 a. 25.80° b. 51.59° **c. 64.20°** d. 115.80°



$$\cos C = \frac{a^2 + b^2 - c^2}{2ab}$$

$$\cos \theta = \frac{150^2 + 180^2 - 280^2}{2(150)(180)}$$

$$\cos \theta = -0.435$$

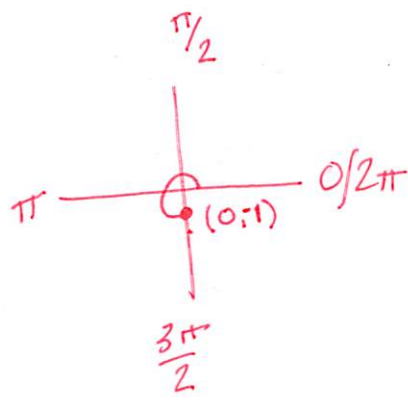
$$\theta = 115.8^\circ$$

$$\theta_1 = 180 - 115.8 = 64.20^\circ$$

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Evaluate the function without using a calculator.



40. $\sin \frac{3\pi}{2}$

a. 0

b. -1

c. $\frac{\sqrt{2}}{2}$

d. $-\frac{\sqrt{2}}{2}$

41. Find $\sin 320^\circ$. Round to four decimal places.

a. 0.7660

b. -0.1928

c. -0.8391

d. -0.6428

42. Find the value of $\cos^{-1}\left(\frac{\sqrt{3}}{2}\right)$. Express your answer in degrees.

a. 30°

b. 30° or 120°

c. 150° or -15°

d. -15°

43. Without using a calculator, find the exact value of $\sin^{-1}\left(\frac{\sqrt{2}}{2}\right)$.

a. $-\frac{3}{4}\pi$

b. $\frac{1}{6}\pi$

c. $-\frac{1}{3}\pi$

d. $\frac{1}{4}\pi$

44. Given triangle ABC with $a = 2$, $C = 41^\circ$, and $B = 42^\circ$, find c . Round the answer to two decimal places.

a. 2.04

b. 1.96

c. 2.97

d. 1.32

45. Three ships are at sea: the Admiral, the Barstow, and the Cauldrew. The crew on the Admiral can see both the Barstow and the Cauldrew. They measure the angle between the line of sight to the Barstow and the line of sight to the Cauldrew as 32° . They radio the Barstow and by comparing known landmarks, find that the distance between the Admiral and the Barstow is 838 meters. The Barstow reports that an angle of 85° is found between their line of sight to the Admiral and their line of sight to the Cauldrew. To the nearest meter, what is the distance between the Barstow and the Cauldrew?

a. 143 meters

b. 45 meters

c. 446 meters

d. 498 meters

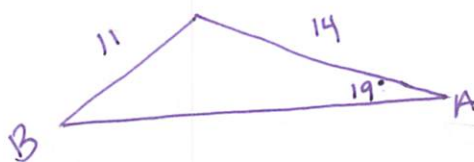
46. Given triangle ABC with $a = 11$, $b = 14$, and $A = 19^\circ$, find c . Round your answer to two decimal places.

a. $c = 17.80$

b. $c = 23.25$ or 4.52

c. $c = 4.82$

d. $c = 23.25$ or 3.23



$$\frac{\sin 19^\circ}{11} = \frac{\sin B}{14}$$

$$\angle B = 24.5^\circ$$

$$(180 - 19 - 24.5) \angle C = 136.5^\circ$$

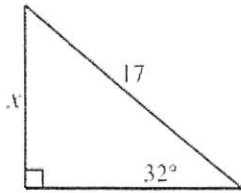
$$c = 23.25$$

$$\frac{\Delta 1}{11} = \frac{\Delta 2}{c}$$

$$\frac{\sin 5.5^\circ}{c} = \frac{\sin 19^\circ}{11}$$

$$c = 3.24$$

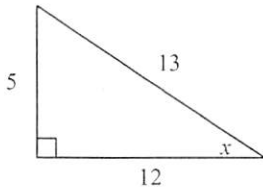
- ___ 34. Find x . Round the result to the nearest hundredth.



$$\sin 32 = \frac{x}{17}$$

- a. $x = 27.21$ c. $x = 10.62$
 b. $x = 9.01$ d. $x = 14.42$

- ___ 35. Write $\cos x$ as a fraction in lowest terms.



- a. $\frac{12}{13}$ c. $\frac{5}{13}$
 b. $1\frac{1}{12}$ d. $\frac{5}{12}$

- ___ 36. Convert 720° to radians.

- a. $\frac{1}{4}\pi$ c. 4π
 b. $\frac{1}{8}\pi$ d. 8π

- ___ 37. Convert $\frac{1}{10}\pi$ to degrees.

- a. 36° b. 18° c. 9° d. 1800°

- ___ 38. Find the arc length of a sector with a radius of 9 feet and a central angle of 6° .

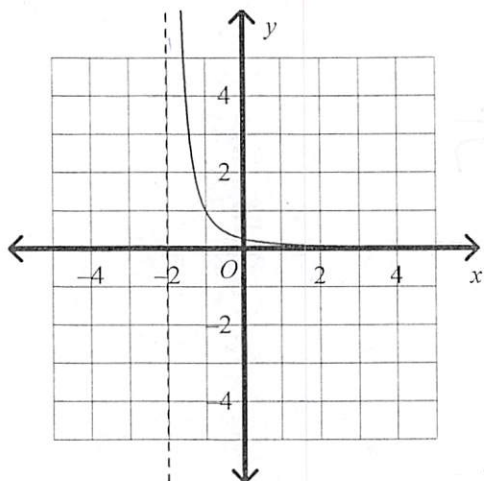
- a. $\frac{3}{2}\pi$ feet c. $\frac{3}{10}\pi$ feet $\frac{\theta}{360} 2\pi r$
 b. 54π feet d. $\frac{3}{5}\pi$ feet

- ___ 39. Find the area of a sector with a central angle of 30° and a radius of 14.1 mm. Round to the nearest tenth. Use 3.14 for pi if necessary.

- a. 52 mm^2 c. 2982.2 mm^2
 b. 104 mm^2 d. 3.7 mm^2

$$\frac{\theta}{360} \pi r^2$$

29. Find the domain and range of the relation and determine whether it is a function.



D: $x > -2$
R: $y > 0$

- a. domain: $x > -2$; range: $y > 0$; Yes, it is a function.
- b. domain: all real numbers; range: all real numbers; Yes, it is a function.
- c. domain: positive integers; range: positive integers; No, it is not a function.
- d. domain: $x \geq 0$; range: $y > -2$; No, it is not a function.

Write the expression as a single logarithm.

30. $4 \log_b x + 6 \log_b t$

a. $\log_b(xt^{4+6})$

b. $(4 + 6) \log_b(x + t)$

c. $\log_b(x^4 + t^6)$

d. $\log_b(x^4 t^6)$

$\log_b x^4 + \log_b t^6 = \log_b x^4 t^6$

31. Use the Change of Base Formula to evaluate $\log_3 97$.

a. 4.575

b. 1.987

c. 4.164

d. 4.164

$\frac{\log 97}{\log 3}$

Solve the exponential equation.

32. $27^{2x} = 9$

a. $\frac{5}{6}$

b. $\frac{1}{3}$

c. 3

d. -6

$3^{3(2x)} = 3^2$

$\ln x = 2$
 $x = \frac{1}{3}$

33. Solve $\ln(5x - 2) = 4$. Round to the nearest thousandth.

a. 54.998

b. 10.520

c. 52.598

d. 11.320

$e^4 = 5x - 2$

$\frac{e^4 + 2}{5} = \frac{5x}{5}$

25. Decide whether the data show inverse variation. If so, find the missing value.

x	.2	-.5	18	-1
y	30	-12	1/3	-6

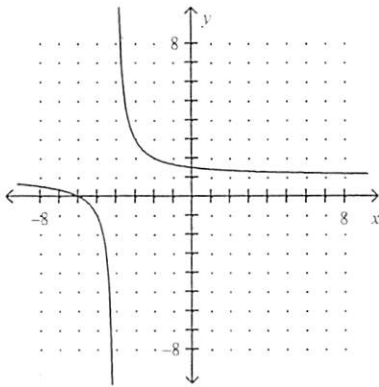
u u u

$$y = \frac{a}{x} \qquad \frac{1}{3} = \frac{u}{x}$$

$$xy = a$$

- a. yes; 18
- b. yes; 2
- c. yes; 12
- d. not an inverse variation

26. Which function matches the graph?



$$x + 4 = 0$$

$$x = -4$$

- a. $f(x) = \frac{x+1}{x+5}$
- b. $f(x) = \frac{x+4}{x+6}$
- c. $f(x) = \frac{x+6}{x+4}$ ← VA @ -4
- d. $f(x) = \frac{x+5}{x+1}$

27. $\frac{n^2-4}{n+2} \cdot \frac{n}{3n-6} = \frac{n(n+2)(n-2)}{3(n+2)(n-2)}$

- a. $3n$
- b. $\frac{1}{3n}$
- c. $\frac{n+2}{n-2}$
- d. $\frac{n}{3}$

28. $\frac{5(x-2)}{x+4} + \frac{2(x+8)}{x-4}$

a. $\frac{7}{x^2-16}$

- b. $\frac{7x-12}{7}$
- c. $\frac{7}{x+4}$
- d. $\frac{7x+12}{x^2-16}$

$$\frac{5x(-20)}{(x+4)(x-4)} + \frac{2x+8}{x-4}$$

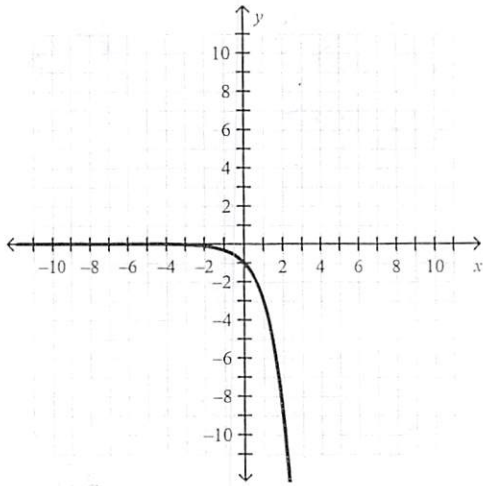
$$3n-6 = 3(n-2)$$

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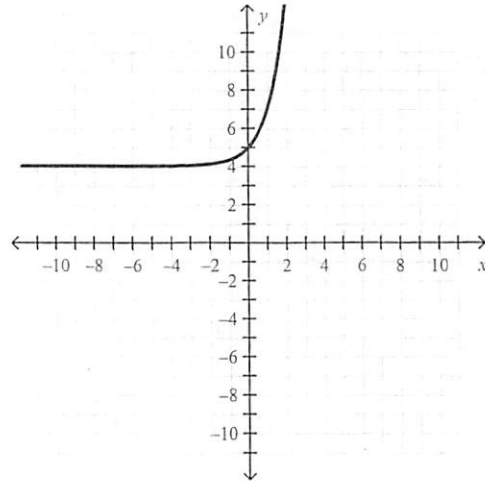
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22. Graph the function: $f(x) = -3^x$

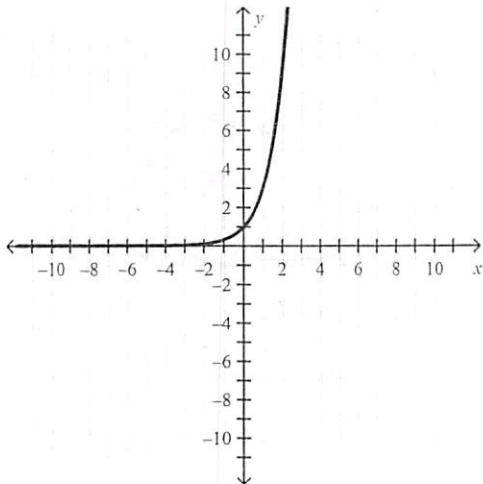
a.



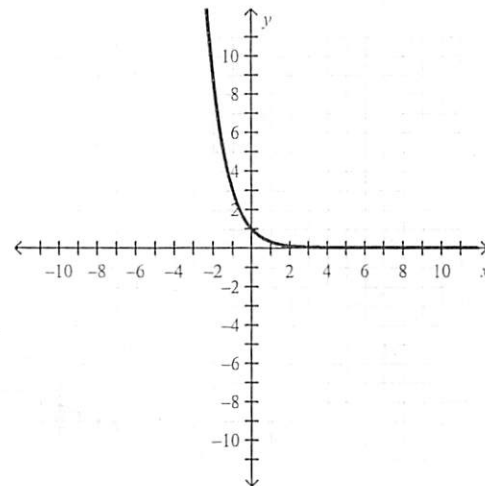
c.



b.



d.



Evaluate:

23. $\log_2 8$

a. $\frac{1}{3}$

b. 3

c. $\frac{1}{6}$

d. 6

$2^{\square} = 8$

Solve the equation. Check for extraneous solutions.

24. $\log_3(3x+4) = 3$

a. $\frac{23}{3}$

b. $\frac{16}{3}$

c. $\frac{1}{3}$

d. $\frac{34}{3}$

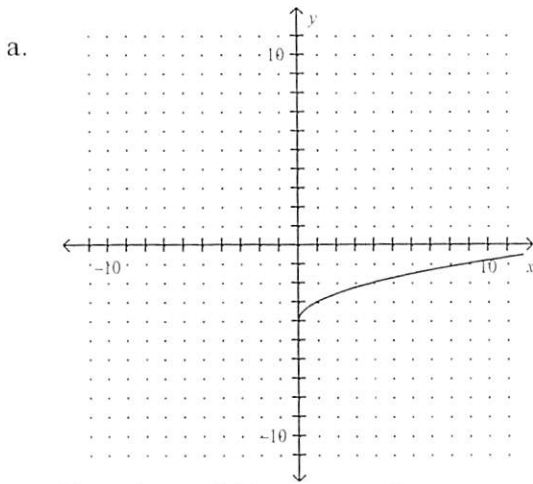
$3^3 = 3x + 4$
 $27 = 3x + 4$
 $23 = 3x$
 $\frac{23}{3} = x$

Name: _____

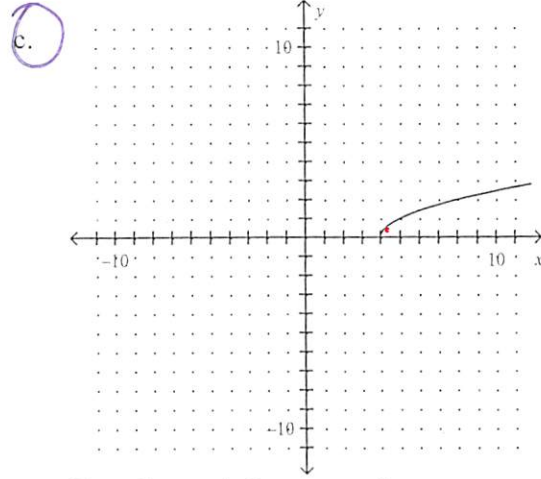
$$y = \sqrt{x}$$

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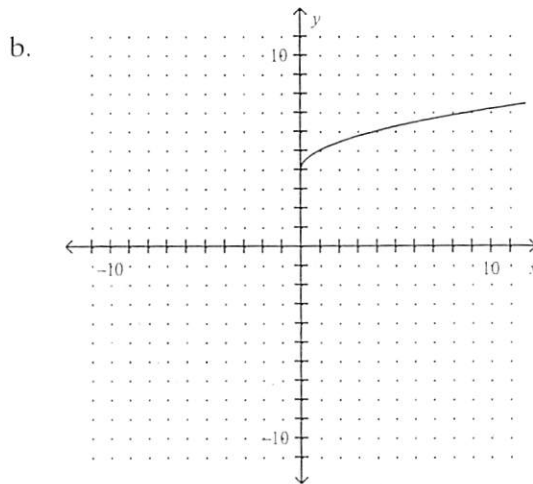
20. Which represents the graph of $y = \sqrt{x-4}$? State the domain and range of the function.



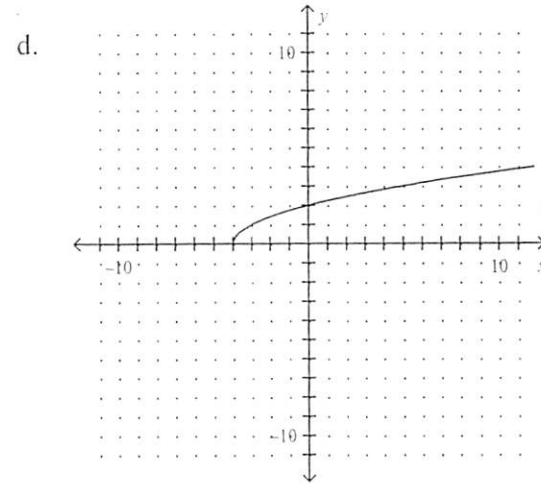
Domain: $x \geq 0$; Range: $y \geq -4$



Domain: $x \geq 4$; Range: $y \geq 0$



Domain: $x \geq 0$; Range: $y \geq 4$



Domain: $x \geq -4$; Range: $y \geq 0$

21. Which gives the solution(s) of the equation $\sqrt[3]{x-6} = 3$?

- a. 33
b. 33, -21

- c. 15
d. -21

$$\sqrt[3]{x-6} = 3$$

$$x-6 = 27$$

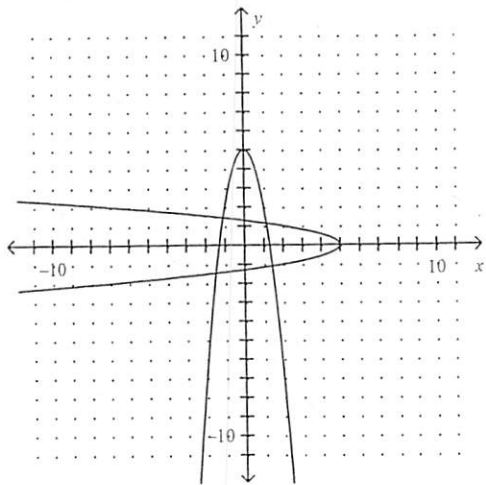
$$x = 33$$

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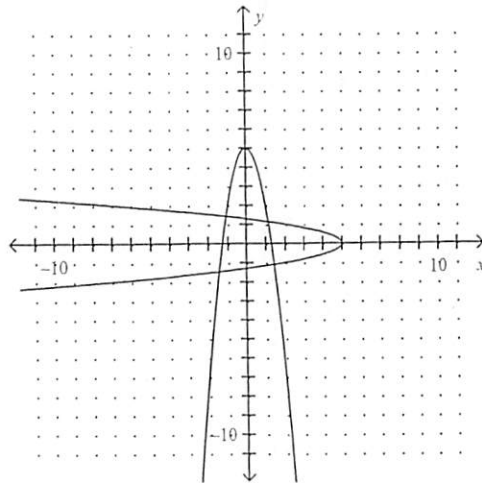
19. Which shows the graph of $y = 3x^2 + 5$ and its reflection over the line $y = x$ and correctly states whether the reflection is the graph of a function?

a.



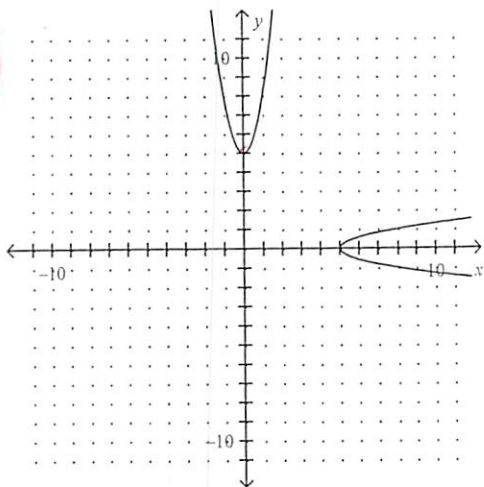
No

c.



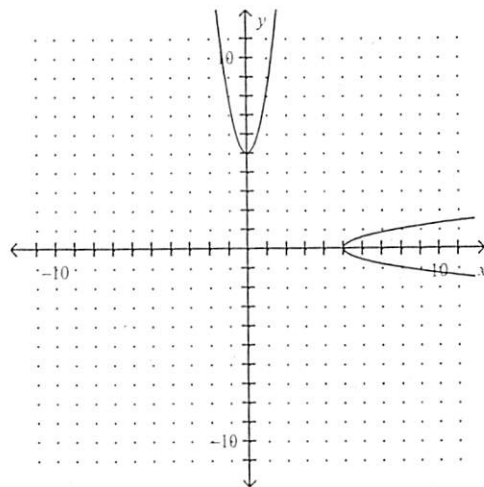
Yes

b.

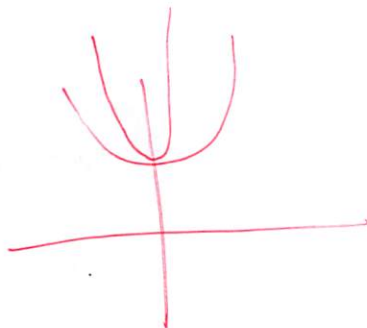


No

d.



Yes



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Divide.

_____ 15. $(3x^4 - 9x^3 - 36x - 45) \div (x - 4)$

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

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

c. $3x^3 + 3x^2 + 12x + 12 + \frac{3}{x-4}$

d. $3x^2 + 3x + 12 + \frac{3}{x-4}$

_____ 16. Simplify $8^{2/3}$.

a. 8

b. $\frac{16}{3}$

c. 4

d. $\frac{1}{2}$

_____ 17. Let $f(x) = x^2 - 4$ and $g(x) = 2x^2$. Find $f(g(x))$.

a. $2x^4 - 4$

b. $4x^4 - 4$

c. $2x^4 - 8$

d. $2x^4 - 16x^2 + 32$

$(2x^2)^2 - 4$

_____ 18. Which is an equation for the inverse of the relation $y = 5x - 3$?

a. $y = -3x + 5$

b. $y = \frac{5x+3}{5}$

c. $y = \frac{x-3}{5}$

d. $y = \frac{x+3}{5}$

$x = 5y - 3$

$\frac{x+3}{5} = y$

$$\begin{array}{r|rrrrr} 4 & 3 & -9 & 0 & -36 & -45 \\ & \downarrow & & & & \\ \hline & & 12 & 12 & 48 & 48 \\ & 3 & 3 & 12 & 12 & 3 \end{array}$$

$$3x^3 + 3x^2 + 12x + 12 + \frac{3}{x-4}$$

Solve.

8. $45x^2 + 38x - 35 = 0$

a. $-\frac{7}{9}, 1$

b. $\frac{7}{9}, 1$

c. $-\frac{7}{5}, \frac{5}{9}$

d. $\frac{7}{5}, \frac{5}{9}$

$$(x - \frac{25}{45})(x + \frac{63}{45})$$

$$(x - \frac{5}{9})(x + \frac{7}{5})$$

Simplify the expression.

9. $6\sqrt{2527} \cdot \sqrt{133}$

a. $798\sqrt{19}$

b. $805\sqrt{7}$

c. $133\sqrt{19}$

d. $32\sqrt{7}$

Solve.

10. $3x^2 + 6 = 114$

a. ± 6

b. no real-number solution

c. $\pm\sqrt{108}$

d. $\pm\sqrt{9}$

11. Use the quadratic formula to solve: $x^2 - 3x - 1 = 0$

a. $\frac{3 + \sqrt{13}}{2}, \frac{3 - \sqrt{13}}{2}$

b. $\frac{-3 + \sqrt{5}}{2}, \frac{-3 - \sqrt{5}}{2}$

c. $\frac{3 + \sqrt{5}}{2}, \frac{3 - \sqrt{5}}{2}$

d. $\frac{-3 + \sqrt{13}}{2}, \frac{-3 - \sqrt{13}}{2}$

Simplify the expression. Give your answer in exponential form.

12. $(6^2 \cdot 5^7)^5$

a. 30^{45}

b. $6^7 \cdot 7^{12}$

c. 30^{15}

d. $6^{10} \cdot 5^{35}$

Find the sum or difference.

13. $(-7j^2 - 3j + 7) - (-2j^2 - 9j - 9)$

a. $-5j^2 + 6j - 2$

b. $-5j^2 - 12j - 2$

c. $-5j^2 - 6j + 16$

d. $-5j^2 + 6j + 16$

Find the real-number solutions of the equation.

14. $v^3 - 2v^2 = 0$

a. 0, 2

b. 0, -2

c. 2, -3

d. -2, 2

$$v^2(v-2) = 0$$

$$0, 2$$

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ID: A

Solve the linear system.

3. $-2x + 3y = +1$
 $2x - 4y = -22$

$2x + 3y + 1 =$
 $7y$

$2x - 4y + 22 =$
 21

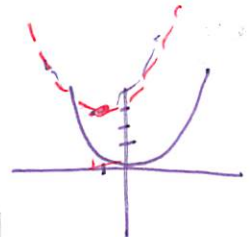
$-7y = -21$
 $y = 3$

- a. (-5, 3)
- b. (1, -3)
- c. (3, -1)
- d. no solution

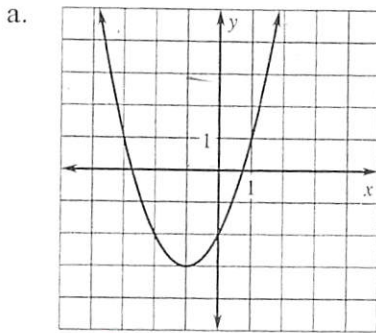
Solve the system of equations.

4. $x + y + z = 4$
 $-2x - y + z = 3$
 $x - 2y - z = 13$

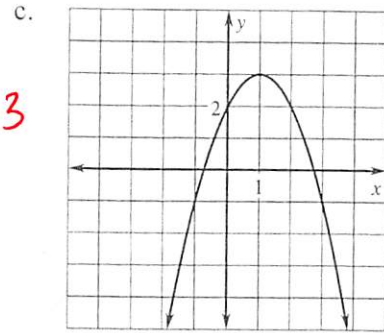
- a. (-5, 7, -6)
- b. (3, -7, -1)
- c. (5, -7, 6)
- d. (-3, 7, 1)



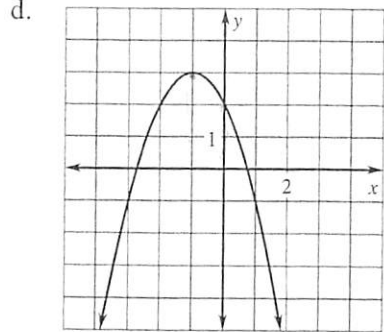
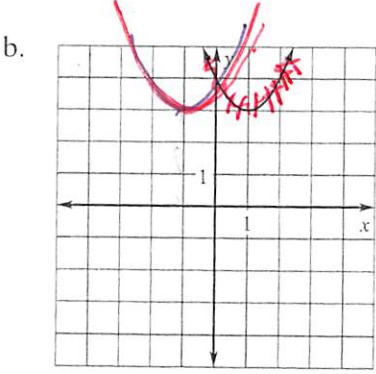
5. Graph the parabola: $y = (x + 1)^2 + 3$



$(-1, 3)$
 $y = (x + 1)^2 - 3$



$y = -(x + 1)^2 + 3$



$y = -(x + 1)^2 + 3$

6. Factor each of the following.

$20x^2 - 17x - 24$

- a. $(5x + 3)(4x - 8)$
- b. $(4x + 3)(5x - 8)$
- c. $(5x - 3)(4x + 8)$
- d. $(4x - 3)(5x + 8)$

7. $4x^2 - 36$

- a. $(2x - 6)(2x - 6)$
- b. $(2x + 6)(2x - 6)$
- c. $(4x + 1)(x - 36)$
- d. $(4x - 1)(x + 36)$

Algebra 2 Sem 2 Final Exam Review

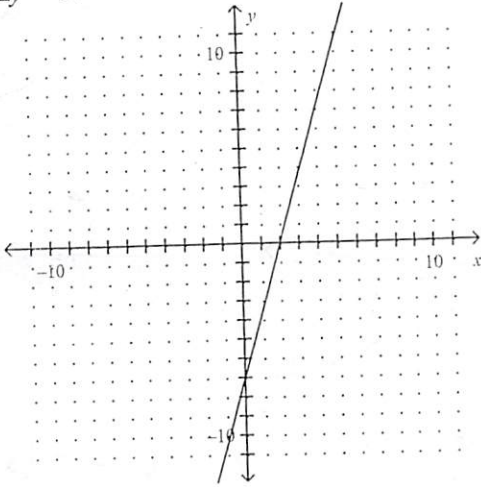
Multiple Choice

Identify the choice that best completes the statement or answers the question.

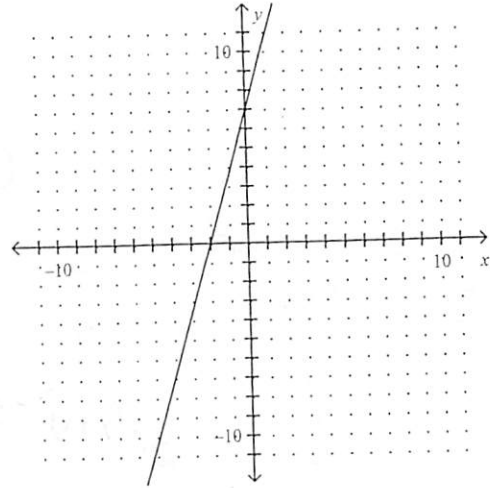
Graph the equation.

1. $7x + 2y = 14$

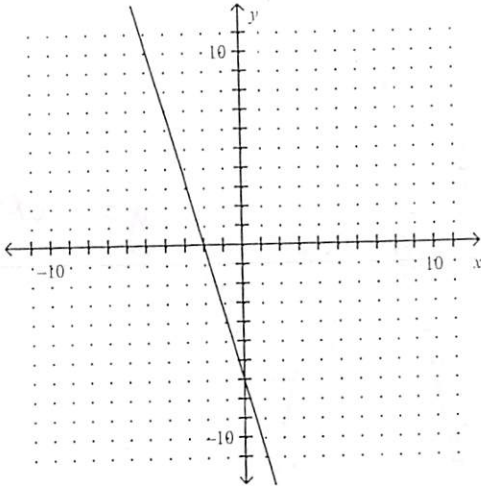
a.



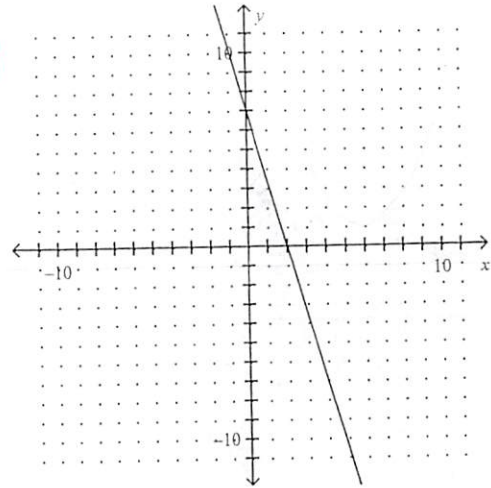
c.



b.



d.



2. Which of the following best describes the graphs of the equations below?

$$6y = -3x + 9$$

$$4y = 8x + 4$$

$$y = \frac{-3}{6}x + \frac{9}{6}$$

$$y = \frac{8}{4}x + \frac{4}{4}$$

$$= \frac{-1}{2}x + \frac{3}{2}$$

$$= 2x + 1$$

- a. The lines are parallel.
- b. The lines are perpendicular.
- c. The lines have the same y-intercept.
- d. The lines have the same x-intercept.