Name: _____   **Date:** _____
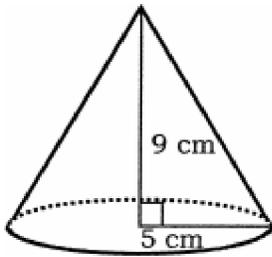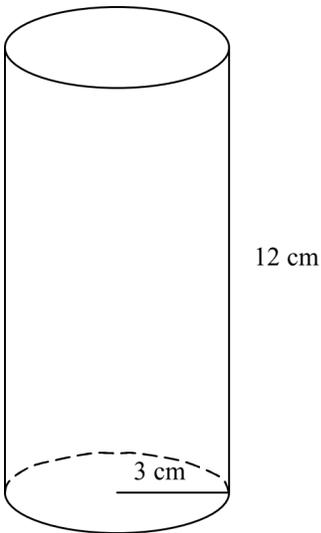
1. What is the **volume** of the given cone?

  A. $225\pi \, cm^3$ B. $75\pi \, cm^3$

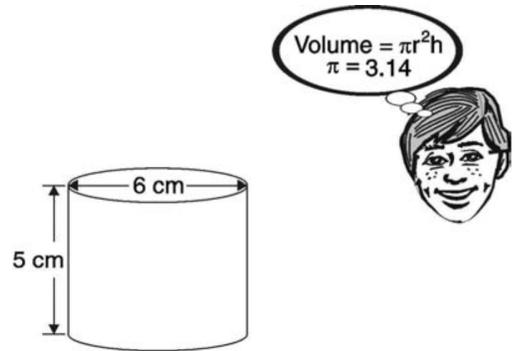 C. $25\pi \, cm^3$ D. $15\pi \, cm^3$

2. The right circular cylinder represented below has a base radius of 3 centimeters and a height of 12 centimeters.

  What is the volume of the right circular cylinder in cubic centimeters?

  A. $36\pi \, cm^3$ B. $72\pi \, cm^3$

  C. $108\pi \, cm^3$ D. $432\pi \, cm^3$

3. Use the picture below to answer the question that follows.
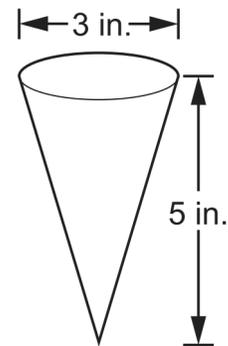

  Which is the volume of the cylinder?

  A. $94.2 \, cm^3$ B. $141.3 \, cm^3$

  C. $188.4 \, cm^3$ D. $565.2 \, cm^3$

4. Cecil has a paper cup in the shape of a cone, as shown below.

Cecil's Paper Cup

  What is the volume of Cecil's paper cup?

  A. $2\frac{1}{2}\pi$ cubic in.   B. $3\frac{3}{4}\pi$ cubic in.

  C. 15π cubic in.   D. 60π cubic in.

5. In 1997 the population of a small town was 700. If the annual rate of increase is about 0.8%, which value below expresses the population five years later?

   A. $5(700)(0.008)$ B. $5(700)(1.008)$

   C. $(700)(0.008)^5$ D. $(700)(1.008)^5$

6. Judy works for a doctor. She placed a sample of bacteria in a culture dish and recorded the number of bacteria present each 30 minutes beginning at 12:00 P.M. The table shows Judy's data.

   Bacterial Growth

Time	Number of Bacteria Present
12:00 P.M.	150
12:30 P.M.	600
1:00 P.M.	2400

   If the pattern of bacterial growth remains constant, how many bacteria should be present in the culture dish at 2:00 P.M.?

7. This table shows the number of subscribers to four magazines.

Year	Subscribers to Music Magazine	Subscribers to Sports Magazine	Subscribers to Business Magazine	Subscribers to History Magazine
1	100,000	100,000	100,000	100,000
2	90,000	90,000	90,000	90,000
3	81,000	80,000	70,000	85,000
4	72,900	70,000	40,000	82,500

   Which magazine's subscribers are *best* modeled by an exponential function?

   A. Music Magazine   B. Sports Magazine

   C. Business Magazine   D. History Magazine

8. Use the equation below to answer the following question.

   As the value of x becomes negative and continues to decrease, what happens to the value of y?

   $$y = 2^x$$

   A. y becomes negative   B. y gets closer to 1

   C. y gets closer to 0   D. y gets closer to x

9. What value of x makes the equation below true?

   $$2^x = 8$$

   A. 2   B. 3   C. 4   D. 6

10. A ticket company will sell 20,000 tickets to a rock concert. The expression below models the expected number of tickets left unsold h hours after the tickets go on sale.

    $$20,000(0.6)^h$$

    What is the expected number of tickets left unsold 3 hours after the tickets go on sale?
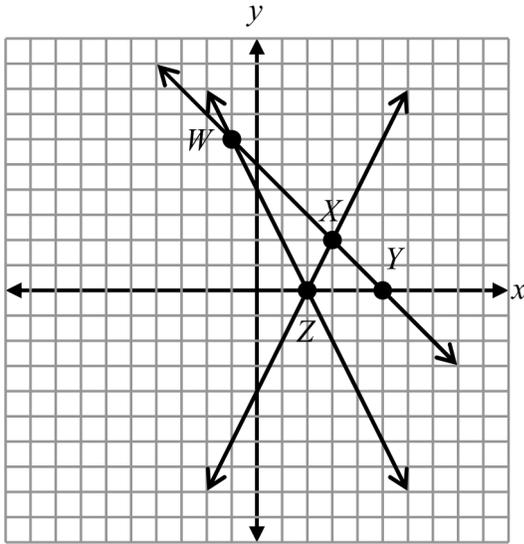
    A. 4,320   B. 12,000

    C. 15,680   D. 36,000

11. Between $x = 0$ and $x = 1$, which function has a greater average rate of change than $y = 2^x$?

    A. $y = 4^x$ B. $y = -2^x$

    C. $y = 2^{x-4}$ D. $y = 2^x + 4$

12. Solve the system of equations below.

$$x + y = 5$$
$$-4x - 2y = -8$$

Which point on the graph below is the solution to the system of linear equations?


A. W   B. X   C. Y   D. Z

13. Members of a senior class held a car wash to raise funds for their senior prom. They charged $3 to wash a car and $5 to wash a pick-up truck or a sport utility vehicle. If they earned a total of $275 by washing a total of 75 vehicles, how many cars did they wash?

A. 25   B. 34   C. 45   D. 50

14. At what point do the lines represented by the equations $2x + y + 1 = 0$ and $4x + y - 3 = 0$ intersect?

A. $(2, 5)$ B. $(2, -5)$

C. $(-1, 1)$ D. $(1, -1)$

15.
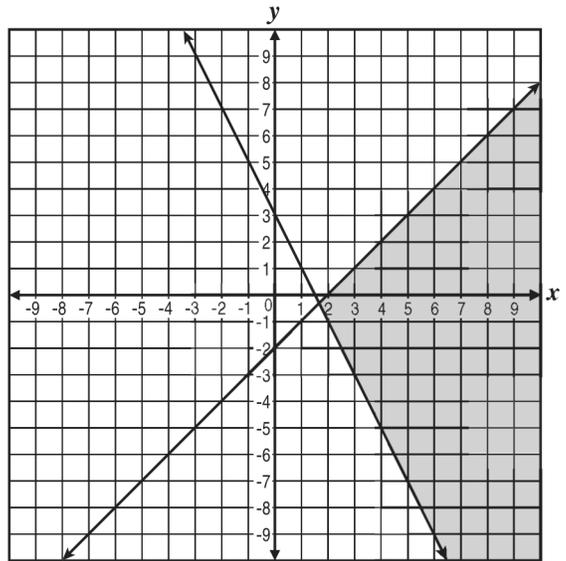
Which system of linear inequalities is represented by this graph?

A. $\begin{cases} y \geq \frac{1}{2} + 3 \\ y \geq x - 2 \end{cases}$ B. $\begin{cases} y \geq 2x + 3 \\ y \leq x - 2 \end{cases}$

C. $\begin{cases} 2x - y \geq 3 \\ x + y \leq 2 \end{cases}$ D. $\begin{cases} 2x + y \geq 3 \\ x - y \geq 2 \end{cases}$

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16. Henry uses a table of values to help solve the system of equations shown.

Equation 1: $3x + 2y = 16$
Equation 2: $x - 4y - 24$

A.

x-value	Equation 1 y-value	Equation 2 y-value
−8	20	−8
−6	17	−7.5
−4	14	−7
−2	11	−6.5

B.

x-value	Equation 1 y-value	Equation 2 y-value
0	8	−6
2	5	−5.5
4	2	−5
6	−1	−4.5

C.

x-value	Equation 1 y-value	Equation 2 y-value
−4	14	−7
−2	11	−6.5
0	8	−6
2	5	−5.5

D.

x-value	Equation 1 y-value	Equation 2 y-value
6	−1	−4.5
8	−4	−4
10	−7	−3.5
12	−10	−3

17. Juan is saving to buy a leather basketball that costs $40.00. He already has $12 and will save $3.50 per week until he has enough money to buy the basketball. At this rate, what is the least number of weeks it will take for Juan to have $40.00?

A. 4   B. 8   C. 12   D. 15

18. A go-cart has a maximum weight limit of 240 pounds. Which inequality correctly represents this weight limit, w?

A. $w \leq 240$ pounds   B. $w < 240$ pounds

C. $w \geq 240$ pounds   D. $w > 240$ pounds
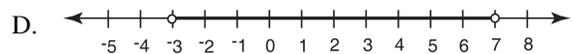
19. What is the solution to the inequality below?
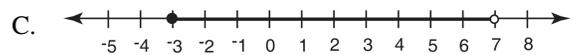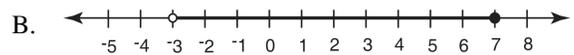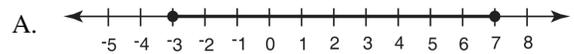
$12x > 5(x - 2)$

A. $x > -\frac{2}{7}$ B. $x < -\frac{2}{7}$

C. $x > -\frac{10}{7}$ D. $x < -\frac{10}{7}$

20. Which response below shows the following inequality graphed correctly on the number line?

$$-3 \leq x < 7$$

A.

B.

C.

D.

21. Jeremy attempted to solve the inequality $-2x + 6 > 10$ following the steps below.

- Subtract 6 from both sides of the inequality.

- Divide both sides of the inequality by -2.

He finds that $x > -2$. Clearly explain why this is not a correct solution. In your response, be sure to explain what Jeremy needs to do to find the correct solution.

22. Gene has $35. He will earn more than $80 next week. He will use all his money to buy clothes. Which number line shows all the possible amounts of money, in dollars, he will have after next week to buy clothes?

A.

B.

C.

D.
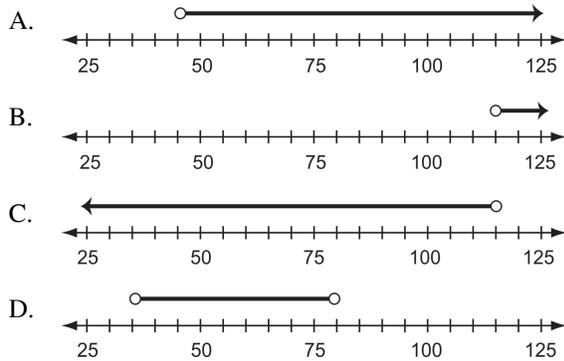
23. Mr. Garcia needs at least 60 paintbrushes for his art classes. He has 22 paintbrushes already and will buy more paintbrushes in packages of 8. Which inequality can be used to find how many packages of paintbrushes, p, Mr. Garcia needs to buy in order to have at least 60 paintbrushes?

A. $8p - 22 \le 60$ B. $8p - 22 \ge 60$

C. $8p + 22 \le 60$ D. $8p + 22 \ge 60$

24. Which graph below represents the solution to the inequality below?

$$2(2x - 6) \ge x + 3$$

A.

B.

C.

D.
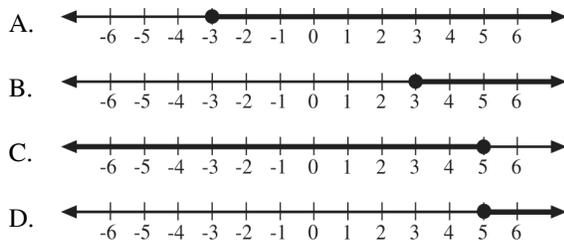
25. Jerry attended a computer software conference.

- He paid $12.00 for admission.
- He spent $11.50 for lunch.
- He paid $1.50 for each workshop ticket.

If Jerry had a total of $35.00 to spend at the conference, which of the following inequalities could be used to determine n, the maximum number of workshop tickets that Jerry could have purchased?
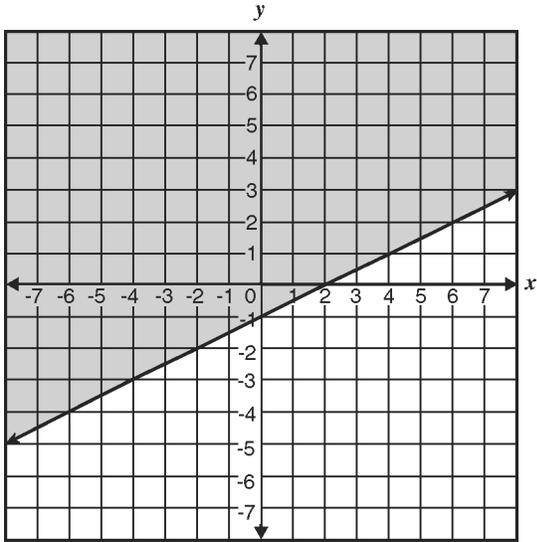
A. $1.50n \le 35.00$

B. $12.00 + 11.50 + 1.50n \le 35.00$

C. $35.00 + 1.50n \le 12.00 + 11.50$

D. $12.00 + 11.50 + 1.50 \le 35.00n$

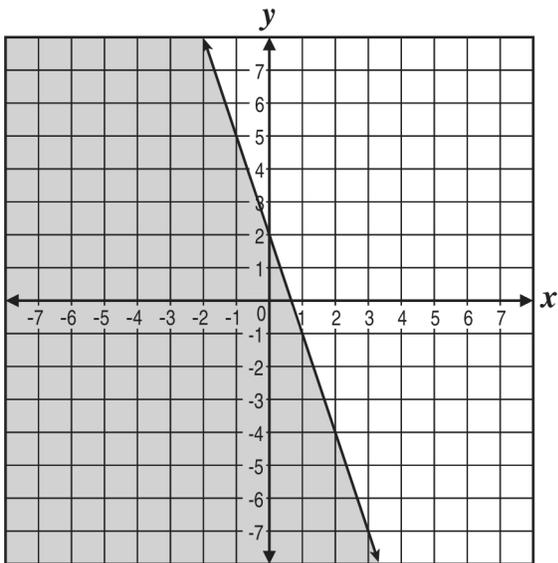26. Which is a correct procedure for solving the linear inequality below?

$$2y + 8 > 4 - 6y$$

A. $2y + 8 > 4 - 6y$
      $-4y + 8 > 4$
      $-4y > -4$
      $y > 1$

B. $2y + 8 > 4 - 6y$
      $8y + 8 > 4$
      $8y > -4$
      $y > -\frac{1}{2}$

C. $2y + 8 > 4 - 6y$
      $-4y + 8 > 4$
      $-4y > -4$
      $y < 1$

D. $2y + 8 > 4 - 6y$
      $8y + 8 > 4$
      $8y > -4$
      $y < -\frac{1}{2}$
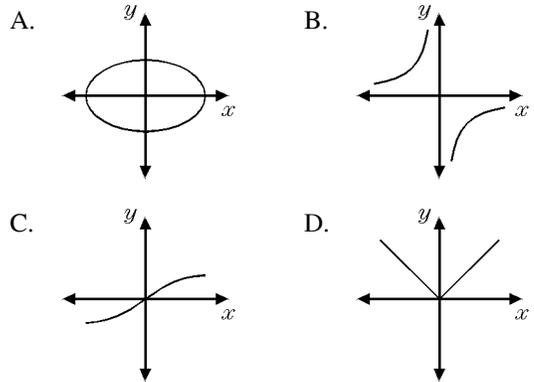
27. Which inequality is shown on the graph below?

   A. $y < \frac{1}{2}x - 1$ B. $y \le \frac{1}{2}x - 1$

   C. $y > \frac{1}{2}x - 1$ D. $y \ge \frac{1}{2}x - 1$

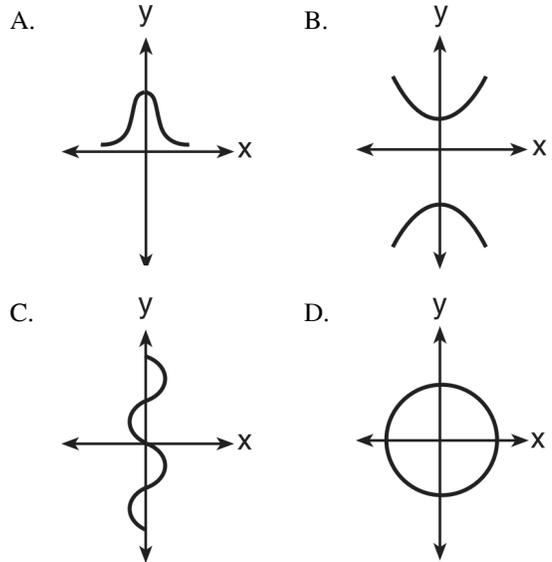28. Which inequality does the shaded region of the graph represent?

   A. $3x + y \le 2$ B. $3x + y \ge 2$
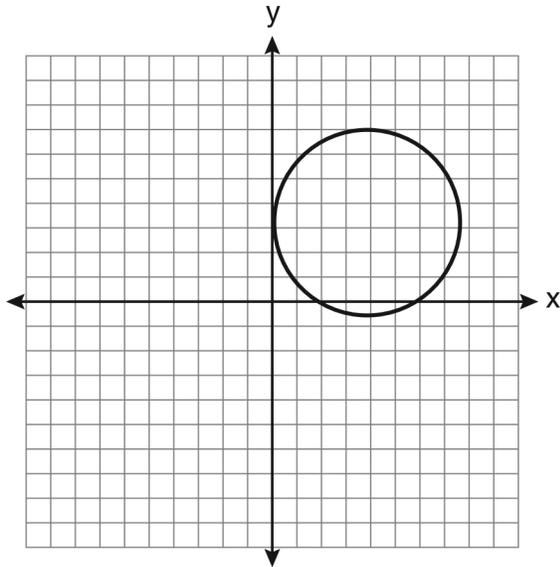
   C. $3x + y \le -2$ D. $3x + y \ge -2$

29. Which diagram is not the graph of a function?

A.

B.

C.

D.

30. Which graph represents a function?

A.

B.

C.

D.

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31. Which statement is true about the relation shown on the graph below?

A. It is a function because there exists one *x*-coordinate for each *y*-coordinate.

B. It is a function because there exists one *y*-coordinate for each *x*-coordinate.

C. It is not a function because there are multiple *y*-values for a given *x*-value.

D. It is not a function because there are multiple *x*-values for a given *y*-value.

32. Which set of ordered pairs does *not* represent a function?

A. $\{(3, -2),\ (-2, 3),\ (4, -1),\ (-1, 4)\}$

B. $\{(3, -2),\ (3, -4),\ (4, -1),\ (4, -3)\}$

C. $\{(3, -2),\ (4, -3),\ (5, -4),\ (6, -5)\}$

D. $\{(3, -2),\ (5, -2),\ (4, -2),\ (-1, -2)\}$

33. Which relation is a function?

A. $\{(\frac{3}{4}, 0), (0, 1), (\frac{3}{4}, 2)\}$

B. $\{(-2, 2), (-\frac{1}{2}, 1), (-2, 4)\}$

C. $\{(-1, 4), (0, 5), (0, 4)\}$

D. $\{(2, 1), (4, 3), (6, 5)\}$

34. A sphere has a diameter of 18 meters. Find the volume of the sphere, in cubic meters, in terms of π.

35. What is the solution for the following system of equations?

$$x = -y$$
$$x + 2y = 6$$

A. $(-2, 2)$ B. $(2, -2)$

C. $(6, -6)$ D. $(-6, 6)$

36. Which ordered pair is the solution of this system of equations

$$3x + 27 = 4$$
$$-2x + 2y = 24$$

A. $(-4, 8)$ B. $(-4, -8)$

C. $(2, -1)$ D. $(2, -5)$

37. What is the solution set of the following system of equations?

$$x + y = 7$$
$$x - y = 3$$

A. $(3, 4)$ B. $(5, 2)$

C. $(10, -3)$ D. $(8, -1)$

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1.
Answer: B

2.
Answer: C

3.
Answer: B

4.
Answer: B

5.
Answer: D

6.
Answer:

7.
Answer: A

8.
Answer: C

9.
Answer: B

10.
Answer: A

11.
Answer: A

12.
Answer: A

13.
Answer: D

14.
Answer: B

15.
Answer: D

16.
Answer: D

17.
Answer: B

18.
Answer: A

19.
Answer: C

20.
Answer: C

21.
Answer: When you divide by a negative number, you also need to reverse the direction of the inequality sign. Jeremy needs to change $x > -2$ to $x < -2$

22.
Answer: B

23.
Answer: D

24.
Answer: A

25.
Answer: B

26.
Answer: B

27.
Answer: D

28.
Answer: A

29.
Answer: A

30.
Answer: A

31.
Answer: C

32.
Answer: B

33.
Answer: D

34.
Answer: $972\,\pi$

35.
Answer: D

36.
Answer: A

37.
Answer: B