

حل تدريبات وفق الهيكل الوزاري القسم الالكتروني منهج ريفيل



تم تحميل هذا الملف من موقع المناهج الإماراتية

موقع المناهج ← المناهج الإماراتية ← الصف التاسع العام ← رياضيات ← الفصل الثاني ← ملفات متنوعة ← الملف

تاريخ إضافة الملف على موقع المناهج: 06:57:44 2025-03-17

ملفات اكتب للمعلم اكتب للطالب | اختبارات الكترونية | اختبارات | حلول | عروض بوربوينت | أوراق عمل
منهج انجليزي | ملخصات وتقارير | مذكرات وبنوك | الامتحان النهائي | للمدرس

المزيد من مادة
رياضيات:

التواصل الاجتماعي بحسب الصف التاسع العام



صفحة المناهج
الإماراتية على
فيسبوك

الرياضيات

اللغة الانجليزية

اللغة العربية

التربية الاسلامية

المواد على تلغرام

المزيد من الملفات بحسب الصف التاسع العام والمادة رياضيات في الفصل الثاني

حل أسئلة تدريبات نهائية وفق الهيكل الوزاري كامل	1
حل أسئلة تجميعية تدريبات وفق الهيكل الوزاري كامل	2
حل ملزمة أسئلة وفق الهيكل الوزاري منهج بريدج	3
تجميعية تدريبات وفق الهيكل الوزاري حسب منهج بريدج	4
حل أسئلة الامتحان النهائي القسم الورقي منهج ريفيل	5

Use substitution to solve each system of equations.

1. $y = 5x + 1$ $\leftarrow y = 5(1) + 1 = 6$
 $4x + y = 10$
 $4x + (5x + 1) = 10$
 $4x + 5x + 1 = 10$
 $9x = 10 - 1 = 9 \div 9$
 $x = 1$ (1, 6)

A) (1,11)
 B) (6,1)
 C) (1,-6)
 D) (1,6)

2. $y = 4x + 5$
 $2x + y = 17$
 $2x + (4x + 5) = 17$
 $2x + 4x + 5 = 17$
 $6x = 17 - 5 = 12 \div 6$
 $x = 2$
 $y = 4(2) + 5 = 13$

A) (2,11)
 B) (2,13)
 C) (13,2)
 D) (-2,5)

3. $y = 3x - 34$
 $y = 2x - 5$
 $3x - 34 = 2x - 5$
 $3x - 2x = 34 - 5$
 $x = 29$
 $y = 2(29) - 5 = 35$

A) (53,29)
 B) (29,35)
 C) (29,53)
 D) (7,-13)

4. $y = 3x - 2$
 $y = 2x - 5$

$3x - 2 = 2x - 5$
 $3x - 2x = -5 + 2$
 $x = -3$
 $y = 3(-3) - 2 = -11$

A) (3,7)
 B) (5,13)
 C) (-3,11)
 D) (-3,-11)

5. $2x + y = 3$
 $4x + 4y = 8$

6. $3x + 4y = -3$
 $x + 2y = -1$

Use substitution to solve each system of equations.

7. $y = -3x + 4$
 $-6x - 2y = -8$
 $-6x - 2(-3x + 4) = -8$
 $-6x + 6x - 8 = -8$
 $-8 = -8$ True

A) (1,1) B) Infinite solution
 C) (1,-1) D) No solutions

8. $-1 = 2x - y$
 $8x - 4y = -4$

A) (2,5) B) Infinite solution
 C) (2,-5) D) No solutions

10. $y = -4x + 11$
 $3x + y = 9$

11. $y = -3x + 1$
 $2x + y = 1$

9. $x = y - 1$
 $-x + y = -1$
 $-(y - 1) + y = -1$
 $-y + 1 + y = -1$
 $1 = -1$ False

A) (2,5) B) Infinite solution
 C) (2,-5) D) No solutions

12. $3x + y = -5$
 $6x + 2y = 10$

Use substitution to solve each system of equations.

13. $5x - y = 5$
 $-x + 3y = 13$

14. $2x + y = 4$
 $-2x + y = -4$

15. $-5x + 4y = 20$
 $10x - 8y = -40$

(14) $y = -2x + 4$ ←
 $-2x + (-2x + 4) = -4$
 $-2x - 2x + 4 = -4$
 $-4x + 4 = -4$
 $-4x = -4 - 4$
 $-4x = -8 \div -4$
 $x = 2$
 $y = -2(2) + 4$
 $y = 0$
 S.S. $\{(2, 0)\}$

Use elimination to solve each system of equations.

15. $x + 4y = 11$

$x - 6y = 11$

$x + 4y = 11$
 $-x + 6y = -11$ Add
 $10y = 0 \div 10$

$y = 0$

$x + 4(0) = 11$

$x = 11$

S.S. $\{(11, 0)\}$

99LES Mode [5] [1]

99LEx [Menu] [(-)] [1] Simul eqn [2]
 ARX

$\square x + \square y = \square$
 $\square x + \square y = \square$

Use elimination to solve each system of equations.

16. $\begin{cases} -x + 3y = 6 \\ x + 3y = 18 \end{cases}$ Add

$$\begin{aligned} 6y &= 24 \div 6 \\ y &= 4 \\ x + 3(4) &= 18 \\ x + 12 &= 18 \\ x &= 18 - 12 = 6 \end{aligned}$$

$(6, 4)$

17. $\begin{cases} 3x + 4y = 19 \\ 3x + 6y = 33 \end{cases}$

18. $\begin{cases} x + 4y = -8 \\ x - 4y = -8 \end{cases}$

19. $\begin{cases} 3x + 4y = 2 \\ 4x - 4y = 12 \end{cases}$ Add

$$\begin{aligned} 7x &= 14 \div 7 \\ x &= 2 \\ 3(2) + 4y &= 2 \\ 6 + 4y &= 2 \\ 4y &= 2 - 6 = -4 \\ y &= -1 \end{aligned}$$

$(2, -1)$

20. $\begin{cases} 3x - y = -1 \\ -3x - y = 5 \end{cases}$

21. $\begin{cases} 2x - 3y = 9 \\ -5x - 3y = 30 \end{cases}$

Use elimination to solve each system of equations.

22. $\begin{cases} x - y = 4 \\ 2x + y = -4 \end{cases}$

23. $\begin{cases} 3x - y = 26 \\ -2x - y = -24 \end{cases}$

24. $\begin{cases} 5x - y = -6 \\ -x + y = 2 \end{cases}$

25. $\begin{cases} 6x - 2y = 32 \\ 4x - 2y = 18 \end{cases}$

26. $\begin{cases} 3x + 2y = -19 \\ -3x - 5y = 25 \end{cases}$ Add

$$\begin{aligned} -3y &= 6 \div -3 \\ y &= -2 \\ 3x + 2(-2) &= -19 \\ 3x - 4 &= -19 \\ 3x &= -19 + 4 = -15 \\ x &= -5 \end{aligned}$$

$(-5, -2)$

27. $\begin{cases} 7x + 4y = 2 \\ x - 7y = 8 \end{cases}$

$$\begin{aligned} 7x + 4y &= 2 \\ -7x - 2y &= -8 \text{ Add} \\ 2y &= -6 \Rightarrow \div 2 \\ y &= -3 \\ 7x + 4(-3) &= 2 \\ 7x - 12 &= 2 \\ 7x &= 14 \\ x &= 2 \end{aligned}$$

$(2, -3)$

- 28.** Twice a number added to another number is 15. The sum of the two numbers is 11. Find the numbers.

numbers x, y

$$\begin{cases} 2x + y = 15 \\ x + y = 11 \end{cases}$$

$(-1) \times$

$$\begin{array}{r} 2x + y = 15 \\ -x - y = -11 \\ \hline x = 4 \end{array}$$

Add

the numbers are 4 and 7

$$4 + y = 11 \Rightarrow y = 7$$

- 29.** Twice a number added to another number is -8 . The difference of the two numbers is 2. Find the numbers.

$$\begin{cases} 2x + y = -8 \\ x - y = 2 \end{cases}$$

Add

$$3x = -6 \Rightarrow x = -2$$

$$2(-2) + y = -8$$

$$-4 + y = -8 \Rightarrow y = -4$$

- 30.** The difference of two numbers is 2. The sum of the same two numbers is 6. Find the numbers.

$$\begin{cases} x - y = 2 \\ x + y = 6 \end{cases}$$

Add

$$2x = 8 \div 2$$

$$x = 4$$

$$4 + y = 6 \Rightarrow y = 6 - 4$$

$$y = 2$$

Use elimination to solve each system of equations.

33. $4(x + 2y) = 8 \div 4$

$$4x + 4y = 12$$

$$x + 2y = 2$$

$$4x + 4y = 12 \div 4$$

$$(-1) \rightarrow x + y = 3 \leftarrow$$

$$\begin{array}{r} x + 2y = 2 \\ -x - y = -3 \\ \hline y = -1 \end{array}$$

$$x + (-1) = 3$$

$$x = 4$$

$$(4, -1)$$

34. $3x - 5y = 11$

$$5(x + y) = 5 \leftarrow$$

$$3x - 5y = 11$$

$$5x + 5y = 5 \text{ Add}$$

$$8x = 16$$

$$x = 2$$

$$5(2) + 5y = 5$$

$$5y = 5 - 10$$

$$5y = -5$$

$$y = -1$$

$$(2, -1)$$

35. $4x + 3y = 6$

$$3(x + y) = 7$$

Use elimination to solve each system of equations.

36. $0.3x - 2y = -28$

$0.8x + 2y = 28$

Add

$1.1x = 0 \quad (-1-1)$

$x = 0$

$0.8(0) + 2y = 28$

$2y = 28 \div 2$

$y = 14$

$(0, 14)$

37. $\frac{1}{2}q - 4r = -2$

$\frac{1}{6}q - 4r = 10$

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

$-\frac{1}{2}x + \frac{2}{3}y = 10$

G9

Solve each system of inequalities by graphing.

1. $y < 6$

$y > x + 3$

dashed line

$0 > 0 + 3$

$0 > 3$ X

\leftarrow Solid

$y = 6$

$y = x + 3$

$x = 0 \quad y = 0 + 3 = 3 \quad (0, 3)$

$x = 1 \quad y = 1 + 3 = 4 \quad (1, 4)$

2. $y \geq 0$

$y \leq x - 5$

$y = x - 5$

$x = 0 \quad y = 0 - 5 = -5$

$x = 2 \quad y = 2 - 5 = -3$

$y = 0$ (x-axis)

$y \leq x - 5$

$0 \leq 0 - 5$

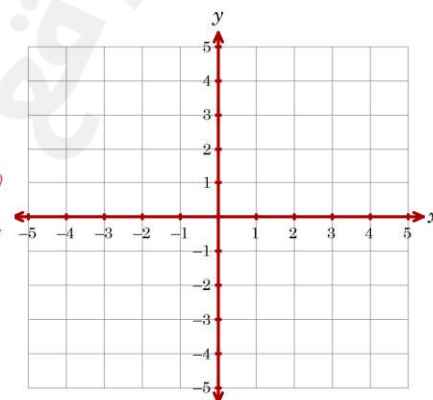
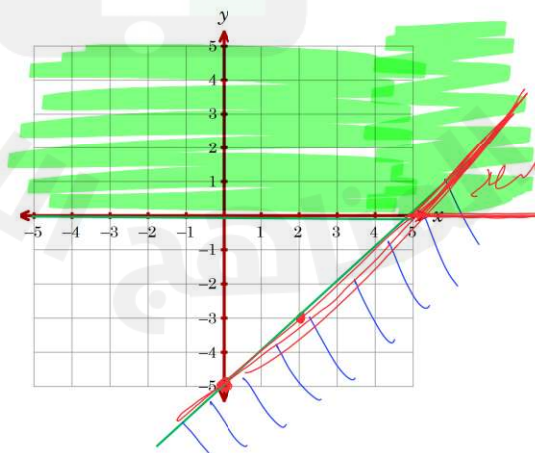
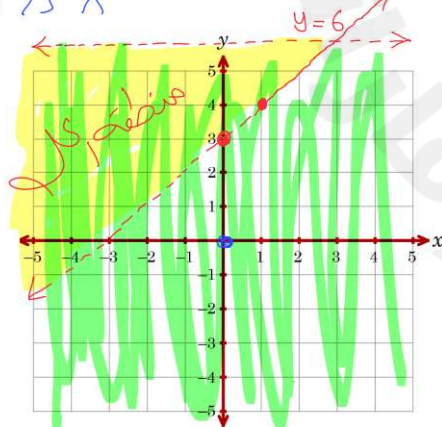
$0 \leq -5$ X

6. $y \geq 3x - 5$

$3x - y > -4$

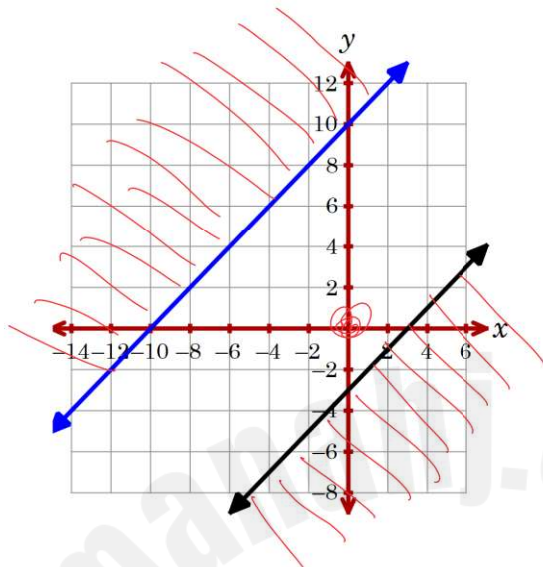
$y = 3x - 5$

Solid

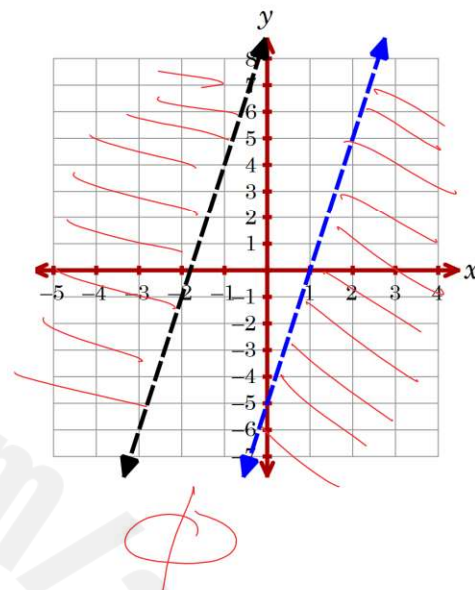


Solve each system of inequalities by graphing.

4. $y \geq x + 10$ ✓ $0 \geq 0 + 10$ $0 \geq 10$
 $y \leq x - 3$
 $0 \leq 0 - 3$
 $0 \leq -3$ ✗



5. $y < 5x - 5$
 $y > 5x + 9$
 $0 > 0 - 5$
 $0 > -5$ ✗
 $0 > 0 + 9$
 $0 > 9$ ✗



Write a system of inequalities for each graph.

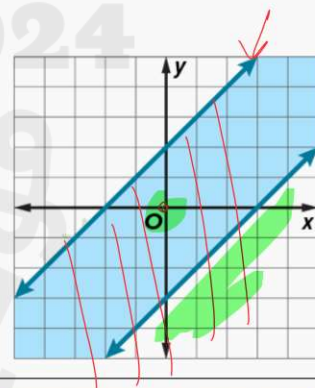
15. A) $x + y < 2$
 $x - y \geq 3$

B) $x + y \leq 2$
 $x - y \geq 3$

C) $x + y \leq 2$
 $x - y \leq 3$

D) $x + y \leq 2$
 $x - y > 3$

$x + y = 2$
 $0 + y = 2$ $(0, 2)$
 $x + 0 = 2$ $(2, 0)$
 $0 - 0 \geq 3$
 $0 \geq 3$ ✗
 $0 + 0 \leq 2$
 $0 \leq 2$

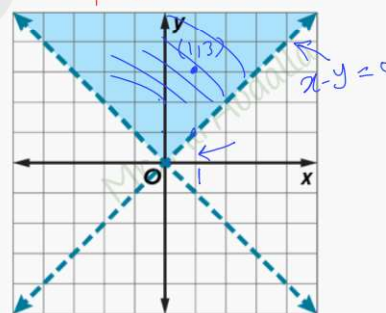


16. A) $x + y < 0$
 $y \geq x$

B) $x + y > 0$
 $x - y \geq 0$

C) $x - y > 0$
 $x + y < 0$
 $3 + 3 < 0$
 $6 < 0$
✗

D) $x - y < 0$
 $y > x$
 $3 > 1$
 $(1, 3)$
 $x - y = 0$
 $0 - y = 0$ $(0, 0)$
 $x - 1 = 0$ $x = 1$ $(1, 1)$
 $1 - 3 < 0$?
 $-2 < 0$ ✓



2 dashed lines

Write a system of inequalities for each graph.

17. A) $y - x \geq 1$

$y < 1$

$y = 1$

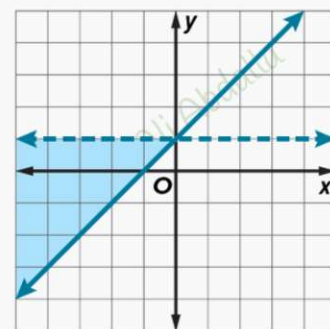
B) $x - y > -1$

$y \geq x$

$y = x$

C) $y - x > 1$
 $y < 1$

D) $y - x > 1$
 $x < 1$



G9

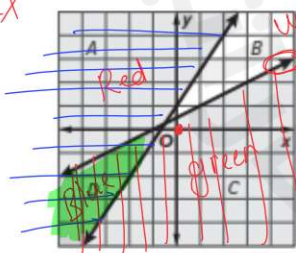
15. MULTIPLE CHOICE The graph shows the solution to the given system of inequalities.

(Lesson 7-5)

$-x + 2y \leq 1$

$-3x + 2y \geq 2$

$0 + 0 \geq 2x$



In what region is the solution set?

A. A

B. B

C. C

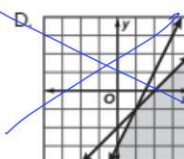
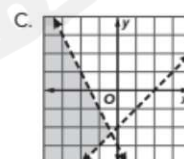
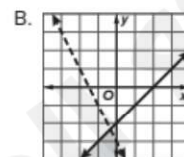
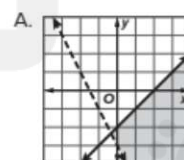
D. D

16. MULTIPLE CHOICE Which graph represents the solution of the system of inequalities?

(Lesson 7-5)

$x - y \geq 2$

$2x + y > -3$



Graph each system and determine the number of solutions it has. If it has one solution, determine its coordinates.

$$\begin{aligned} 11. \quad y &= -3 \\ y &= x - 3 \end{aligned}$$

$$x=0 \quad y=0-3=-3$$

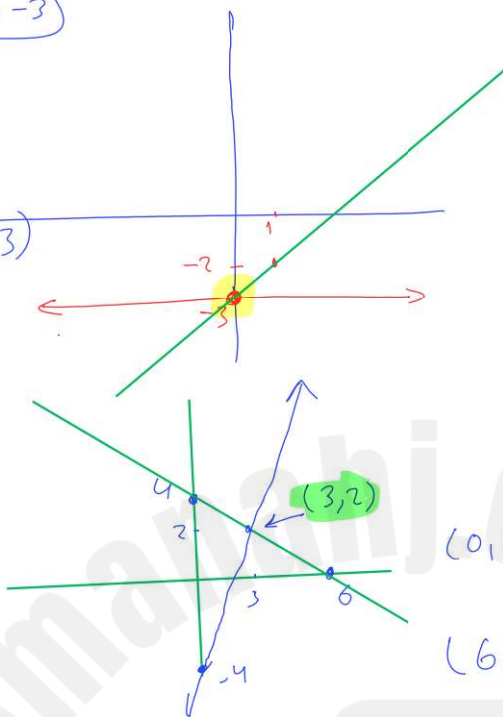
$$x=1 \quad y=1-3=-2$$

one solution $(0, -3)$

$$\begin{aligned} 13. \quad y &= x - 6 \\ y &= x + 2 \end{aligned}$$

$$\begin{aligned} 15. \quad x - y &= -2 \\ -x + y &= 2 \end{aligned}$$

$$y = -3$$



one solution
→ infinite many solutions
no solution

$$\begin{aligned} 12. \quad y &= 4x + 2 \\ y &= -2x - 4 \end{aligned}$$

$$\begin{aligned} 14. \quad x + y &= 4 \\ 3x + 3y &= 12 \end{aligned}$$

$$\begin{aligned} 16. \quad 2x + 3y &= 12 \\ 2x - y &= 4 \end{aligned}$$

$$\begin{aligned} 2x + 3y &= 12 \\ 2(0) + 3y &= 12 \\ 3y &= 12 \\ y &= 4 \\ 2x + 0 &= 12 \\ 2x &= 12 \\ x &= 6 \end{aligned}$$

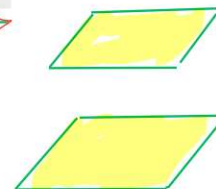
$$\begin{aligned} 2x - y &= 4 \\ 0 - y &= 4 \\ -y &= 4 \\ y &= -4 \\ 2x - 2 &= 4 \\ 2x &= 6 \\ x &= 3 \end{aligned}$$

USE TOOLS Draw and label a figure for each relationship.

20. Points X and Y lie on \overleftrightarrow{CD} .



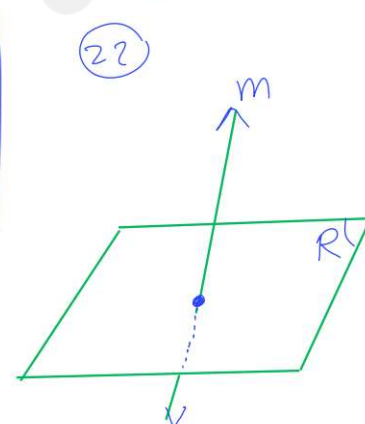
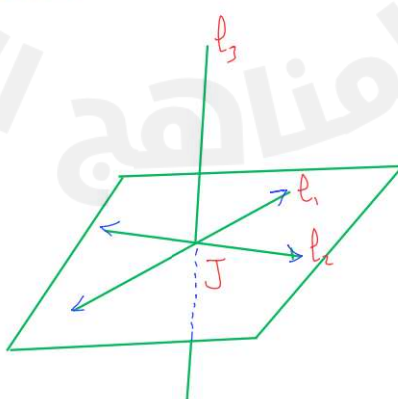
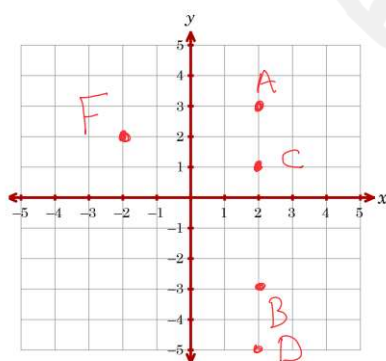
21. Two planes do not intersect.



22. Line m intersects plane R at a single point.

23. Three lines intersect at point J but do not all lie in the same plane.

24. Points $A(2, 3)$, $B(2, -3)$, C , and D are collinear, but A , B , C , D , and F are not.



Refer to the figure for Exercises 25–28.

25. How many planes are shown in the figure?

- A) 4 B) 5 C) 6 D) 7

26. How many of the planes contain points F and E?

- A) 1 B) 2 C) 3 D) 4

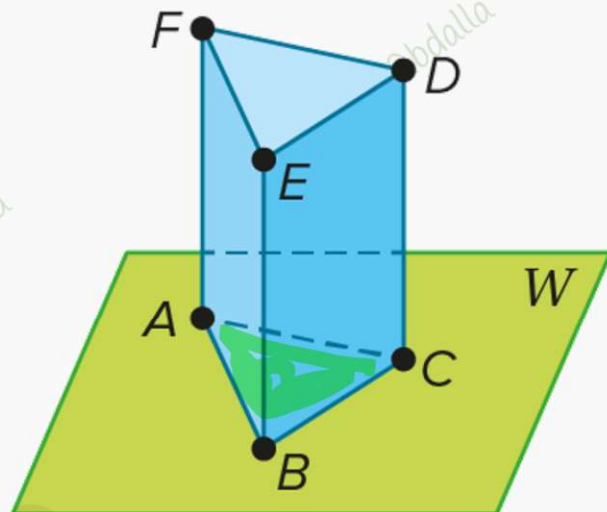
27. Name four points that are coplanar.

Which of the following are not coplanar?

- A) A, B, E, F Coplanar B) B, C, D, F
 C) B, C, D, E Coplanar D) A, C, D, F Coplanar

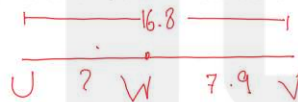
28. Are points A, B, and C coplanar? Explain.

- A) Yes: Points A, B and C lie in plan W
 B) Yes: Points A, B and C lie in plan EBCD
 C) No: Points A, B and C not lie in same plan
 D) No: Points A, B lie in plan W and C not.

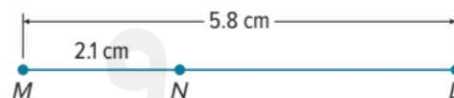


34. Find the length of \overline{UW} if W is between U and V, $UV = 16.8$ centimeters, and $VW = 7.9$ centimeters.

$$\begin{aligned} UW &= 16.8 - 7.9 \\ &= 8.9 \text{ cm} \end{aligned}$$



38. Find the measure of \overline{NL} .



$$\begin{aligned} NL &= 5.8 - 2.1 \\ &= 3.7 \text{ cm} \end{aligned}$$

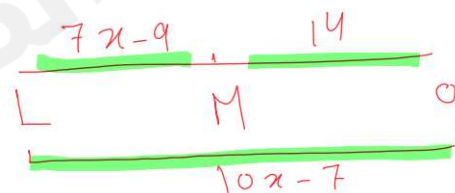
35. Find the value of x if $RS = 24$ centimeters.

$$\begin{aligned} 6x - 4 + 10 &= 24 \\ 6x + 6 &= 24 \\ 6x &= 24 - 6 = 18 \\ x &= 3 \end{aligned}$$



36. Find the length of \overline{LO} if M is between L and O, $LM = 7x - 9$, $MO = 14$ inches, and $LO = 10x - 7$.

$$\begin{aligned} 10x - 7 &= 7x - 9 + 14 \\ 10x - 7x &= -9 + 14 + 7 \Rightarrow 3x = 12 \\ x &= 4 \end{aligned}$$



37. Find the value of x if $\overline{PQ} \cong \overline{RS}$, $PQ = 9x - 7$, and $RS = 29$.

$$\begin{aligned} 9x - 7 &= 29 \Rightarrow 9x = 36 \Rightarrow x = 4 \end{aligned}$$

Find the distance between each pair of points. Round to the nearest tenth, if necessary.

31. $M(-4, 9), N(-5, 3)$

32. $C(2, 4), D(5, 7)$

33. $A(5, 1), B(3, 6)$

34. $V(4, 4), X(5, 8)$

Find the distance between each pair of points. Round to the nearest tenth, if necessary.

35. $S(6, 4), T(3, 2)$

36. $M(-1, 8), N(-3, 3)$

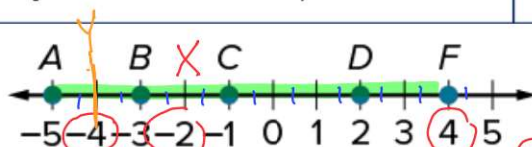
37. $W(-8, 1), Y(0, 6)$

38. $B(3, -4), C(5, -5)$

39. $R(6, 11), T(3, -7)$

40. $A(-3, 8)$ and $B(-1, 4)$

Refer to the number line.



$$\frac{9}{3} = \boxed{3} \times 1 = \boxed{3}$$

15. Find the coordinate of point X on \overline{AF} that is $\frac{1}{3}$ of the distance from A to F .

$$X = x_1 + \frac{a}{b}(x_2 - x_1)$$

$$= -5 + \frac{1}{3}(4 + 5)$$

$$= -5 + \frac{1}{3}(9) = -5 + 3 = \boxed{-2}$$

16. Find the coordinate of point Y on \overline{AC} that is $\frac{1}{4}$ of the distance from A to C .

$$Y = x_1 + \frac{a}{b}(x_2 - x_1)$$

$$= -5 + \left(\frac{1}{4}\right)(-1 + 5)$$

$$= -5 + \frac{1}{4}(4)$$

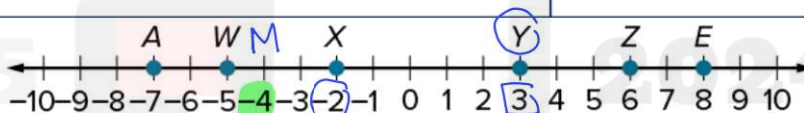
$$= -5 + 1 = \boxed{-4}$$

$$A \rightarrow x_1 = -5$$

$$C \rightarrow x_2 = -1$$

$$\frac{a}{b} = \frac{1}{4}$$

Refer to the number line.



17. Which point on \overline{AE} is $\frac{2}{3}$ of the distance from A to E ?

$$x_1 + \frac{a}{b}(x_2 - x_1) = -7 + \frac{2}{3}(8 + 7) = -7 + \frac{2}{3}(15)$$

$$= -7 + 10 = \boxed{3}$$

$$x_1 = -7 \quad \frac{a}{b} = \frac{2}{3}$$

$$x_2 = 8$$

Point Y

18. Point X is what fractional distance from E to A ?

$$X = x_1 + \frac{a}{b}(x_2 - x_1)$$

$$-2 = 8 + \frac{a}{b}(-7 - 8) \Rightarrow -2 - 8 = \frac{a}{b}(-15) \Rightarrow -10 = (-15) \frac{a}{b} \Rightarrow \frac{a}{b} = \frac{-10}{-15} = \boxed{\frac{2}{3}}$$

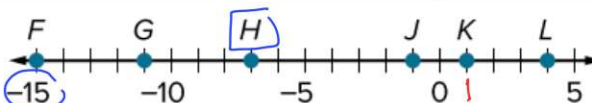
19. Find the coordinate of point M on \overline{AE} that is $\frac{1}{5}$ of the distance from A to E .

$$M = x_1 + \frac{a}{b}(x_2 - x_1)$$

$$= -7 + \frac{1}{5}(8 + 7) = -7 + 3 = \boxed{-4}$$

$$x_1 = -7$$

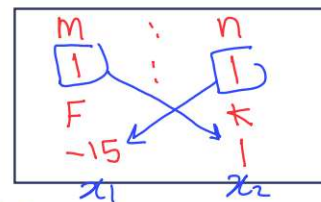
Refer to the number line.



20. The ratio of \overline{FX} to \overline{XK} is $1:1$. Which point is located at X ?

$$X = \frac{nx_1 + mx_2}{m + n}$$

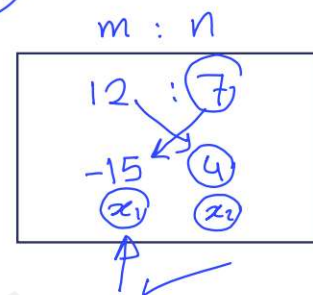
$$X = \frac{1(-15) + 1(1)}{1 + 1} = -7$$



21. Find the coordinate of Q on \overline{FL} such that ratio of \overline{FQ} to \overline{QL} is $12:7$.

$$Q = \frac{nx_1 + mx_2}{m + n}$$

$$\frac{7(-15) + 12(4)}{12 + 7} = -3$$



Find the measure of \overline{AC} if B is the midpoint of \overline{AC} .



Because B is the midpoint, $AB = BC$. Use this equation to solve for x .

$$AB = BC$$

Definition of midpoint

$$5x - 3 = 2x + 9$$

Substitution

$$3x - 3 = 9$$

Subtract $2x$ from each side.

$$3x = 12$$

Add 3 to each side.

$$x = 4$$

Divide each side by 3.

The length of \overline{AC} is equal to the sum of AB and BC . So, to find the length of \overline{AC} , substitute 4 for x in the expression $5x - 3 + 2x + 9$.

$$AC = 5x - 3 + 2x + 9$$

Length of \overline{AC}

$$= 5(4) - 3 + 2(4) + 9$$

$x = 4$

$$= 20 - 3 + 8 + 9$$

Multiply.

$$= 34$$

Simplify.

The measure of \overline{AC} is 34.

Find the measure of \overline{RS} if S is the midpoint of \overline{RT} .



A. 56

B. 58

C. 112

D. 116

$$\begin{aligned} RS &= ST \\ 7x - 5 &= 6x + 4 \\ 7x - 6x &= 4 + 5 \\ x &= 9 \end{aligned}$$

$$\begin{aligned} RS &= 7x - 5 \\ &= 7(9) - 5 \\ &= 63 - 5 \\ &= 58 \end{aligned}$$

10	Find missing values using the definition of a segment bisector	Example 6	603
		39-48	606

Suppose M is the midpoint of \overline{FG} . Find each missing measure.

39. $FM = 5y + 13$, $MG = 5 - 3y$, $FG = ?$

$$F \text{ --- } M \text{ --- } G$$

$$FM = MG$$

$$5y + 13 = 5 - 3y$$

$$5y + 3y = 5 - 13$$

$$8y = -8 \Rightarrow y = -1$$

$$FG = 2FM$$

$$= 2(5y + 13)$$

$$= 2[5(-1) + 13]$$

$$= 16$$

40. $FM = 3x - 4$, $MG = 5x - 26$, $FG = ?$

Because M is the midpoint, $FM = MG$. Use this

$FM = MG$ Definition of midpoint
 $3x - 4 = 5x - 26$ Substitution
 $-2x - 4 = -26$ Subtract $5x$ from each side.
 $-2x = -22$ Add 4 to each side
 $x = 11$ Divide each side by -2 .

$FG = 3x - 4 + 5x - 26$
 $= 3(11) - 4 + 5(11) - 26$
 $= 33 - 4 + 55 - 26$
 $= 58$

The measure of \overline{FG} is 58.

41. $FM = 8a + 1$, $FG = 42$, $a = ?$

$FM = \frac{1}{2}FG$ Definition of midpoint
 $8a + 1 = \frac{1}{2}(42)$ Substitution
 $8a + 1 = 21$ Multiply.
 $8a = 20$ Subtract 1 from each side
 $a = 2.5$ Divide each side by 8.

42. $MG = 7x - 15$, $FG = 33$, $x = ?$

$$F \text{ --- } M \text{ --- } G$$

$$FG = 33$$

$$MG = 7x - 15$$

$$FG = 2MG$$
 or $MG = \frac{1}{2}FG$
 $33 = 2(7x - 15)$
 $33 = 14x - 30$
 $33 + 30 = 14x \Rightarrow 63 = 14x \Rightarrow x = \frac{63}{14}$

Suppose M is the midpoint of \overline{FG} . Find each missing measure.

43. $FM = 3n + 1$, $MG = 6 - 2n$, $FG = ?$

$$F \text{ --- } M \text{ --- } G$$

$$FM = MG$$

$$3n + 1 = 6 - 2n$$

$$\Rightarrow 3n + 2n = 6 - 1 \Rightarrow 5n = 5 \Rightarrow n = 1$$

$$FG = 2FM = 2(3n + 1) = 6n + 2$$

$$= 6(1) + 2 = 8$$

44. $FM = 12x - 4$, $MG = 5x + 10$, $FG = ?$

$FM = MG$
 $12x - 4 = 5x + 10$
 $7x - 4 = 10$
 $7x = 14$
 $x = 2$

$FG = 12x - 4 + 5x + 10$
 $= 12(2) - 4 + 5(2) + 10$
 $= 24 - 4 + 10 + 10$
 $= 40$

The measure of \overline{FG} is 40.

45. $FM = 2k - 5$, $FG = 18$, $k = ?$

$$F \text{ --- } M \text{ --- } G$$

$$FG = 2FM$$

$$18 = 2(2k - 5)$$

$$\Rightarrow 18 = 4k - 10 \Rightarrow 18 + 10 = 4k$$

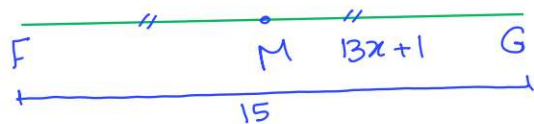
$$\Rightarrow 4k = 28 \Rightarrow k = 7$$

46. $FG = 14a + 1$, $FM = 14.5$, $a = ?$

$FG = 2FM$ Definition of midpoint
 $14a + 1 = 2(14.5)$ Substitution
 $14a + 1 = 29$ Multiply.
 $14a = 28$ Subtract 1 from each side.
 $a = 2$ Divide each side by 14.

Suppose M is the midpoint of \overline{FG} . Find each missing measure.

47. $MG = 13x + 1$, $FG = 15$, $x = ?$



$$FG = 2MG \quad \text{or} \quad MG = \frac{1}{2}FG \leftarrow$$

$$15 = 2(13x + 1)$$

$$15 = 26x + 2$$

$$15 - 2 = 26x$$

$$13 = 26x \div 13$$

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

48. $FG = 11x - 15.6$, $MG = 10.9$, $x = ?$

$$FG = 2MG$$

Definition of midpoint

$$11x - 15.6 = 2(10.9)$$

Substitution

$$11x - 15.6 = 21.8$$

Multiply.

$$11x = 37.4$$

Add 15.6 to each side.

$$x = 3.4$$

Divide each side by 11.

Find the distance between the two points on a coordinate plane.

$$A(5, 1), B(-3, -3)$$

$$x_1, y_1 \quad x_2, y_2$$

A. $4\sqrt{5}$

B. $4\sqrt{3}$

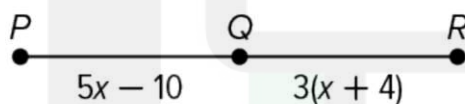
C. $2\sqrt{2}$

D. $2\sqrt{3}$

$$\begin{aligned} d &= \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} \\ &= \sqrt{(-3 - 5)^2 + (-3 - 1)^2} \\ &= \sqrt{64 + 16} \\ &= \sqrt{80} \\ &= 4\sqrt{5} \end{aligned}$$

Find the value of x if Q is between P and R , $PQ = 5x - 10$,

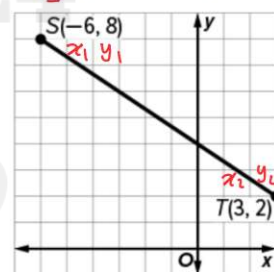
$$QR = 3(x + 4), \text{ and } \overline{PQ} \cong \overline{QR}.$$



$$\begin{aligned} PQ &= QR \\ 5x - 10 &= 3(x + 4) \\ 5x - 10 &= 3x + 12 \\ 5x - 3x &= 12 + 10 \\ 2x &= 22 \\ x &= 11 \end{aligned}$$

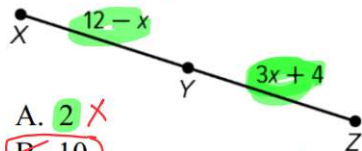
Find point R on \overline{ST} such that the ratio of SR to RT is 1:2.

- A. $R(-5, 6)$
 B. $R(-3, 6)$
 C. $R(-1.5, 5)$
 D. $R(0, 4)$



$$\begin{aligned} \frac{1}{-6} & \frac{2}{8} \rightarrow \frac{-12}{-6} = 2 \\ x &= \frac{-12 + 3}{1 + 2} = \frac{-9}{3} = -3 \\ \frac{1}{8} & \frac{2}{2} \rightarrow \frac{16}{8} = 2 \\ y &= \frac{16 + 2}{1 + 2} = \frac{18}{3} = 6 \end{aligned}$$

Find the measure of YZ if Y is the midpoint of \overline{XZ} .



- A. 2
B. 10
C. 16
D. 20

$$\begin{aligned} YZ &= 3x + 4 \\ &= 3(2) + 4 \\ &= 10 \end{aligned}$$

$$XY = YZ$$

$$12 - x = 3x + 4$$

$$12 - 4 = 3x + x$$

$$8 = 4x \quad \div 4$$

$$x = 2$$

Find the y -coordinate of the point M , the midpoint of \overline{AB} , for $A(-3, 3)$ and $B(5, 7)$.

A. -1

B. 1

C. 2

D. 5

$$\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$\frac{y_1 + y_2}{2}$$

$$= \frac{3 + 7}{2}$$

$$= 5$$

Points A and B are plotted on a number line. What is the location of M , the midpoint of \overline{AB} , for A at -9 and B at 28 ?

A. M is located at 18.5 on the number line.

B. M is located at 14 on the number line.

C. M is located at 9.5 on the number line.

D. M is located at $\frac{10}{3}$ on the number line.

$$\frac{x_1 + x_2}{2} = \frac{-9 + 28}{2}$$

$$= \frac{19}{2}$$

$$= 9.5$$

11 Analyze figures using the definitions of angles and parts of angles

15-17

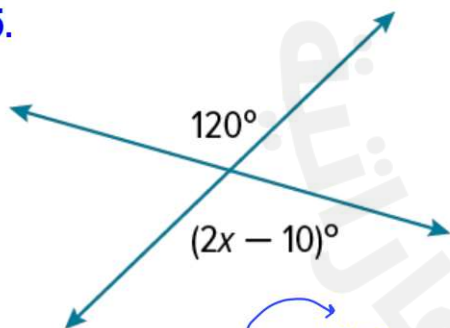
622

34-36

623

Find the value of each variable.

15.



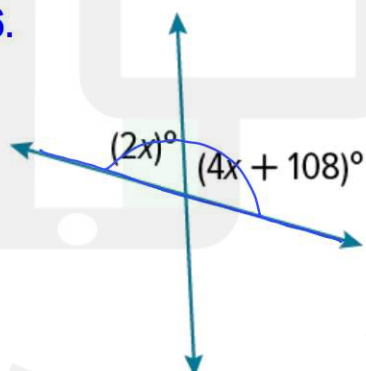
$$2x - 10 = 120$$

$$2x = 120 + 10$$

$$2x = 130 \quad \div 2$$

$$x = 65$$

16.



$$2x + 4x + 108 = 180$$

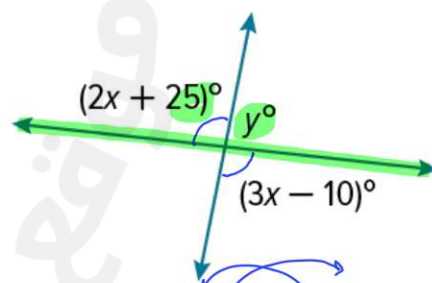
$$6x + 108 = 180$$

$$6x = 180 - 108$$

$$6x = 72$$

$$x = 12$$

17.



$$3x - 10 = 2x + 25$$

$$3x - 2x = 25 + 10$$

$$x = 35$$

$$y + 2x + 25 = 180$$

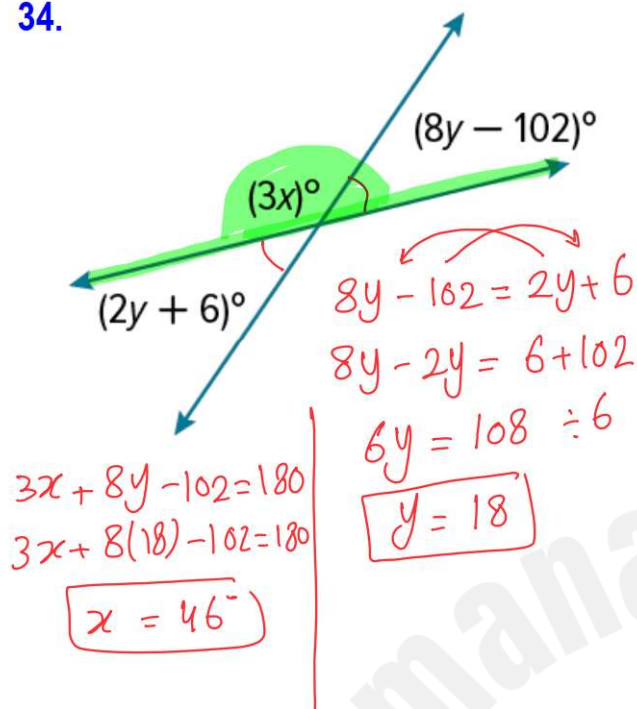
$$y + 2(35) + 25 = 180$$

$$y = 180 - 95$$

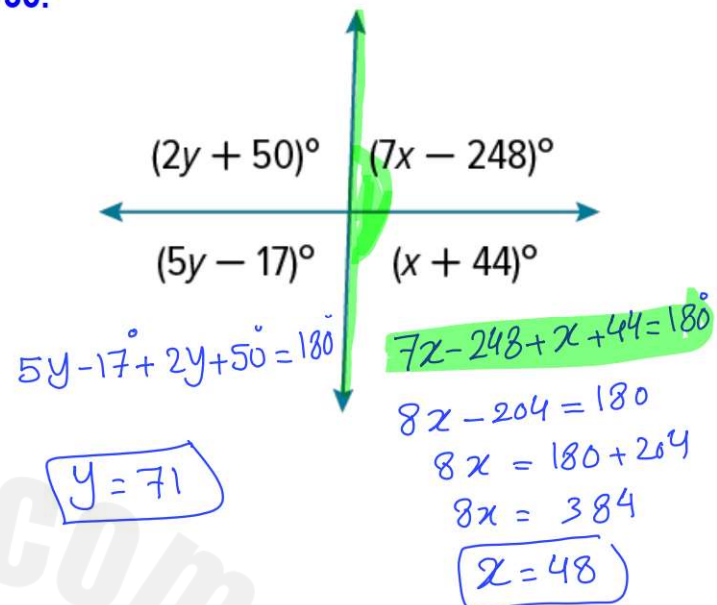
$$y = 85$$

Find the value of each variable.

34.

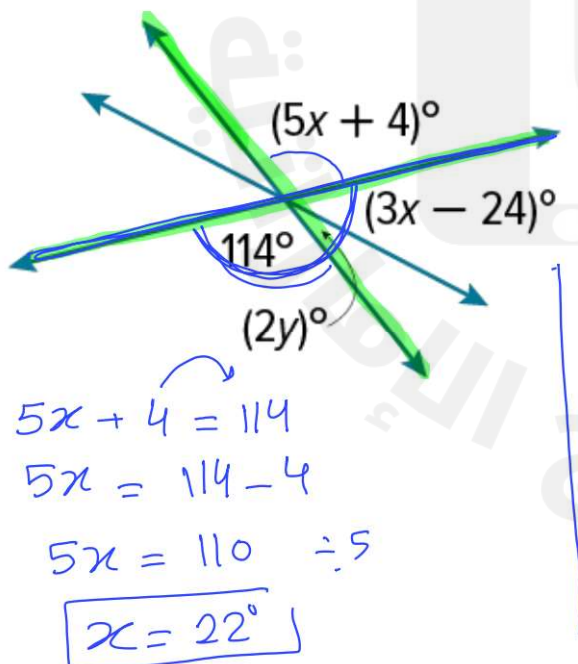


35.



Find the value of each variable.

36.



$$114 + 2y + 3x - 24 = 180$$

$$114 + 2y + 3(22) - 24 = 180$$

$$114 + 2y + 66 - 24 = 180$$

$y = 11$

Find the perimeter or circumference and area of each figure if each unit on the graph measures 1 centimeter. Round answers to the nearest tenth, if necessary.

1. $AB = 4 \text{ cm}$

$AC = 8 \text{ cm}$

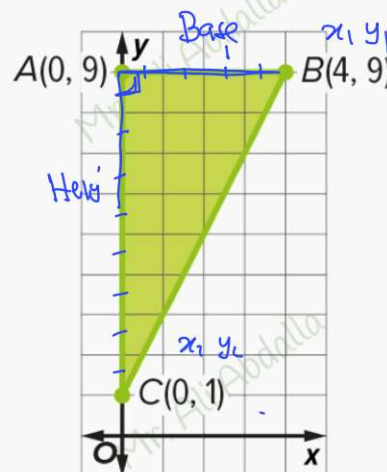
$$BC = \sqrt{(0-4)^2 + (1-9)^2} = 4\sqrt{5} \\ = 8.9 \text{ cm}$$

Perimeter:

$$P = 4 + 8 + 8.9 = 20.9 \text{ cm}$$

Area

$$= \frac{1}{2}(4)(8) \\ = 16 \text{ cm}^2$$



Find the perimeter or circumference and area of each figure if each unit on the graph measures 1 centimeter. Round answers to the nearest tenth, if necessary.

2.

$$CD = \sqrt{(2+4)^2 + (0-3)^2} = 6.7 \text{ cm}$$

$$BC = \sqrt{(4-2)^2 + (4-0)^2} = 4.5 \text{ cm}$$

$$AB = \sqrt{(-2-4)^2 + (7-4)^2} = 6.7 \text{ cm}$$

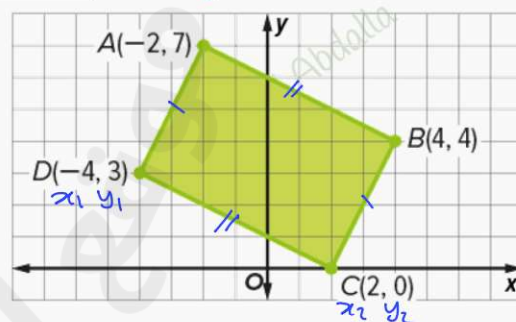
$$AD = \sqrt{(-2+4)^2 + (7-3)^2} = 4.5 \text{ cm}$$

Perimeter:

$$P = 2(6.7) + 2(4.5) = 22.4 \text{ cm}$$

Area

$$A = lw = (6.7)(4.5) \\ = 30.15 \approx 30.2 \text{ cm}^2$$



$$6.7 + 4.5 + 6.7 + 4.5$$

Find the perimeter or circumference and area of each figure if each unit on the graph measures 1 centimeter. Round answers to the nearest tenth, if necessary.

3.

$$r = \sqrt{(4-2)^2 + (1-3)^2}$$

$$= 2\sqrt{2} = 2.8 \text{ cm}$$

circumference:

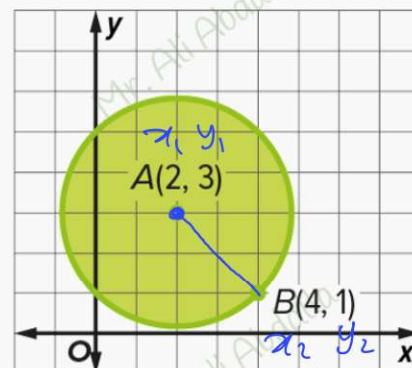
$$C = 2\pi r = 2\pi(2.8)$$

$$= 17.6 \text{ cm}$$

Area

$$A = \pi r^2 = \pi(2.8)^2$$

$$= 24.6 \text{ cm}^2$$

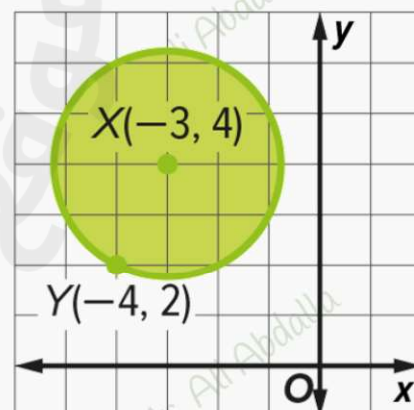


Find the perimeter or circumference and area of each figure if each unit on the graph measures 1 centimeter. Round answers to the nearest tenth, if necessary.

4.

circumference:

Area



Find the perimeter or circumference and area of each figure if each unit on the graph measures 1 centimeter. Round answers to the nearest tenth, if necessary.

5.

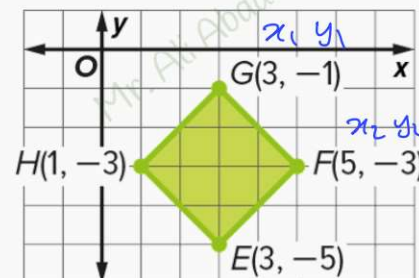
$$\begin{aligned} GF &= \sqrt{(5-3)^2 + (-3+1)^2} \\ &= \sqrt{4+4} = \sqrt{8} = 2\sqrt{2} \quad \text{Square} \\ &= 2.8 \end{aligned}$$

perimeter:

$$P = 4(2.8) = 11.2 \text{ cm}$$

Area

$$A = (2.8)^2 \approx 7.8 \text{ cm}^2$$



Find the perimeter or circumference and area of each figure if each unit on the graph measures 1 centimeter. Round answers to the nearest tenth, if necessary.

6.

$$BC = 6 \text{ cm}$$

$$AB = \sqrt{(2-0)^2 + (0-4)^2} = \sqrt{20} = 2\sqrt{5} = 4.5$$

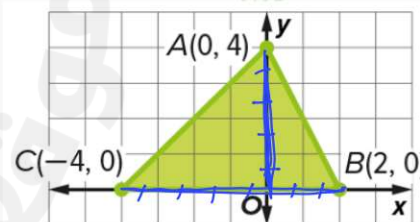
$$AC = \sqrt{(-4-0)^2 + (0-4)^2} = \sqrt{32} = 4\sqrt{2} = 5.7$$

perimeter:

$$P = 6 + 4.5 + 5.7 =$$

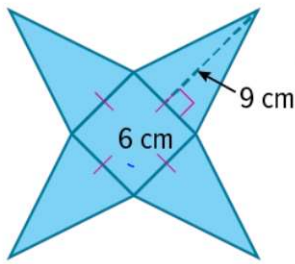
Area

$$A = \frac{1}{2}(6)(4) = 12 \text{ cm}^2$$



$$\begin{aligned} OA &= 4 \text{ cm} \\ A(0, 4), O(0, 0) \\ AO &= 4 \end{aligned}$$

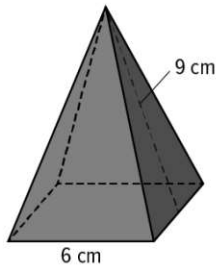
Make a model of the solid that is represented by each net. Then identify the solid and find its surface area.



Square pyramid

$$S = [4 \text{ area of one triangle}] + \text{Area of Base}$$

$$= 4 \left[\frac{1}{2} (6) (9) \right] + 6^2$$



Make a model of the solid that is represented by each net. Then identify the solid and find its surface area.

triangular prism

$$S = Ph + 2B$$

$$= 6(3.3) + 2(1.5)$$

$$= 19.8 + 3$$

$$= 22.8 \text{ cm}^2$$

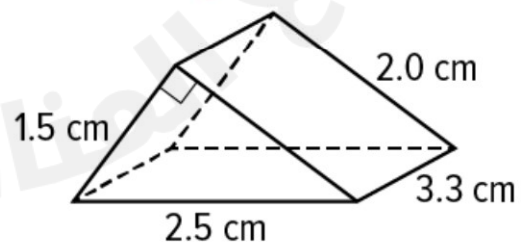
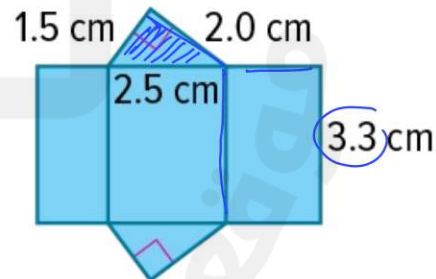
$$P = 1.5 + 2 + 2.5$$

$$= 6$$

$$B = \text{area of Base}$$

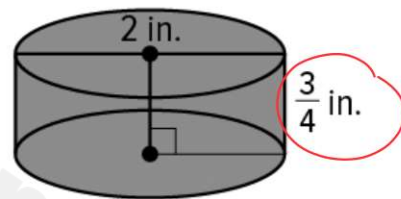
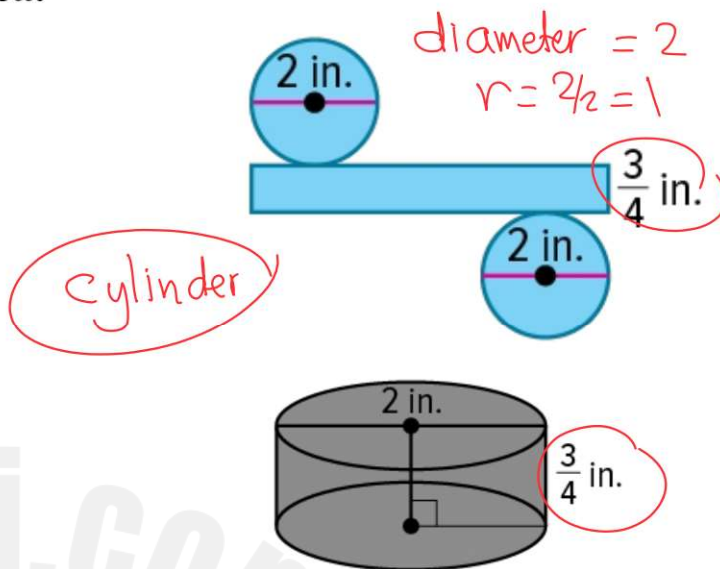
$$= \frac{1}{2} (2) (1.5)$$

$$= 1.5$$



Make a model of the solid that is represented by each net. Then identify the solid and find its surface area.

$$\begin{aligned}
 S &= 2\pi r h + 2\pi r^2 \\
 &= 2\pi r (h + r) \\
 &= 2\pi (1) \left(\frac{3}{4} + 1\right) \\
 &= 2\pi \left(\frac{7}{4}\right) \\
 &= 3.5\pi
 \end{aligned}$$



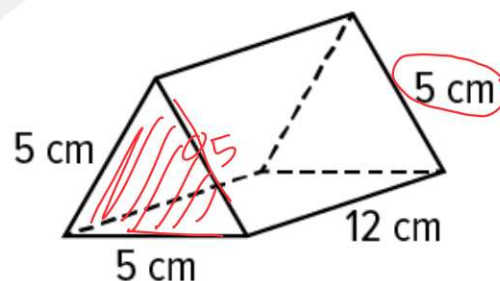
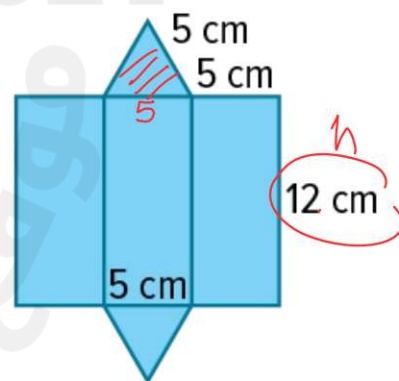
Make a model of the solid that is represented by each net. Then identify the solid and find its surface area.

triangular prism

$$S = Ph + 2B$$

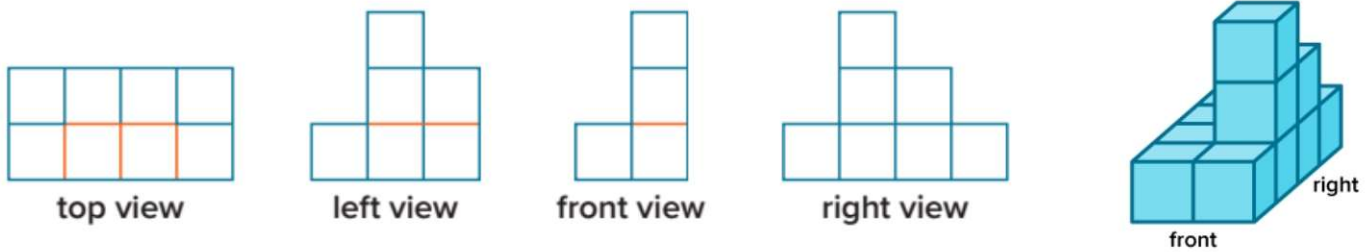
$$B = \frac{\sqrt{3}}{4} s^2 = \frac{\sqrt{3}}{4} (5)^2$$

$$P = 5 + 5 + 5 = 15$$

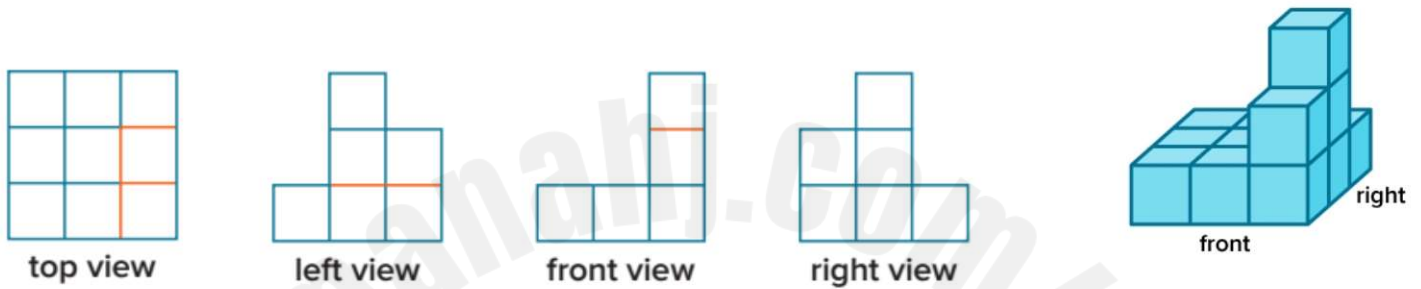


Make a model of a figure for each orthographic drawing.

1.

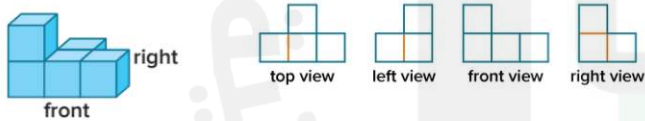


2.

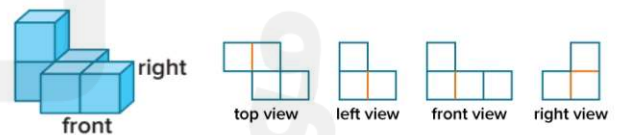


Make an orthographic drawing of each figure.

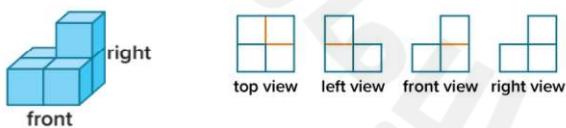
3.



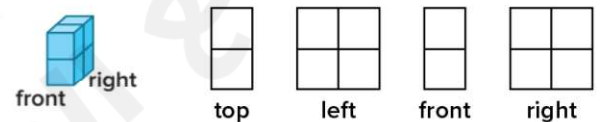
4.



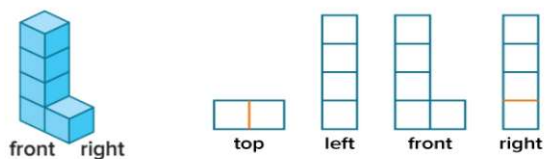
5.



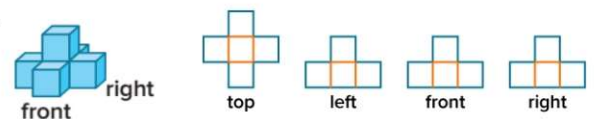
6.



7.



8.



Identify the figure with the given vertices. Find the perimeter and area of the figure.

14. A(3, 5), B(3, 1), C(0, 1)

$$AB = \sqrt{(3-3)^2 + (5-1)^2} = \sqrt{0+16} = 4$$

$$BC = \sqrt{(0-3)^2 + (1-1)^2} = 3$$

$$AC = \sqrt{(3-0)^2 + (5-1)^2} = \sqrt{9+16} = 5$$

$$P = 4 + 3 + 5 = 12 \text{ units}$$

$$(5)^2 = (3)^2 + (4)^2 \quad \text{right triangle}$$

$$A = \frac{1}{2}(3)(4) = 6 \text{ units Squared}$$

triangle; 12 units; 6 units²

15. Q(-3, 2), R(1, 2), S(1, -4), T(-3, -4)

$$QR = \sqrt{(1+3)^2 + (2-2)^2} = 4$$

$$RS = \sqrt{(1-1)^2 + (-4-2)^2} = 6$$

$$ST = \sqrt{(-3-1)^2 + (-4+4)^2} = 4$$

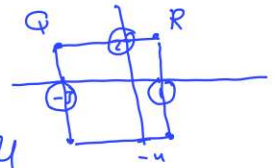
$$QT = \sqrt{(-3+3)^2 + (2+4)^2} = 6$$

rectangle

$$P = 4 + 6 + 4 + 6 = 20$$

$$A = lw = 4(6) = 24$$

quadrilateral; 20 units; 24 units²



Identify the figure with the given vertices. Find the perimeter and area of the figure.

16. G(-4, 1), H(4, 1), I(0, -2)

17. K(-1, 1), L(3, 4), M(6, 0), N(2, -3)

triangle; 18 units; 12 units²

quadrilateral; 20 units; 25 units²

18. Rectangle WXYZ has a length that is 5 more than three times its width.

a. Draw and label a figure for rectangle WXYZ.

b. Write an algebraic expression for the perimeter of the rectangle.

c. Find the width if the perimeter is 58 millimeters. Explain how you can check that your answer is correct.

b. let $\text{width} = x \Rightarrow \text{length} = 3x + 5$

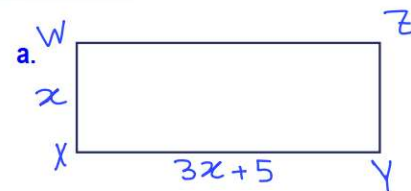
$$\begin{aligned} P &= 2\ell + 2w \\ &= 2(3x + 5) + 2(x) \\ &= 6x + 10 + 2x = 8x + 10 \end{aligned}$$

c. $58 = 8x + 10 \Rightarrow 58 - 10 = 8x \Rightarrow 48 = 8x \Rightarrow x = 6$

The width is found to be 6 mm. To check that this answer is correct, use the value of the width to determine the length, 23. The sum of all four sides, $23 + 23 + 6 + 6$, should equal 58.

$$\begin{aligned} x &= 6 \\ 6 \end{aligned}$$

$$\ell = 3x + 5 = 3(6) + 5 = 23$$



the width = 6 mm

19. **FENCING** The figure shows Derek's house and his backyard on a coordinate grid. Derek is planning to fence in the play area in his backyard. Part of the play area is enclosed by the house and does not need to be fenced. Each unit on the coordinate grid represents 5 feet. The cost for the fencing materials and installation is \$10 per foot. How much will it cost Derek to install the fence? Explain.

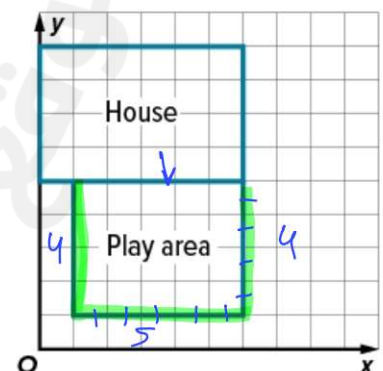
$$\begin{aligned} 13(5) &= 65 \text{ ft} \times 10 \\ &= 650 \$ \end{aligned}$$

$$\begin{aligned} P &= 4 + 5 + 4 \\ &= 13 \end{aligned}$$

$$13 \text{ unit}$$

$$\begin{aligned} \text{Total cost} &= (\text{cost per foot})(\text{units})(\text{feet per unit}) \\ &= (10)(13)(5) \\ &= 650 \end{aligned}$$

The cost of the fencing is \$10 per foot, so the total cost will be \$650.



$$1 \text{ unit} = 5 \text{ ft}$$

$$1 \text{ ft} \rightarrow 10 \$$$

20. Explain a method to find the area of $\triangle QRS$ given that $\overline{RT} \perp \overline{QS}$. Then find the area. Show your work.

$$A = \frac{1}{2} \text{ Base} \cdot \text{Height}$$

$$= \frac{1}{2} QS \cdot TR$$

$$QS = \sqrt{(2-8)^2 + (4+2)^2} = 6\sqrt{2}$$

$$TR = \sqrt{(6-3)^2 + (6-3)^2} = 3\sqrt{2}$$

$$A = \frac{1}{2} (6\sqrt{2})(3\sqrt{2})$$

$$= 18 \text{ square unit}$$

