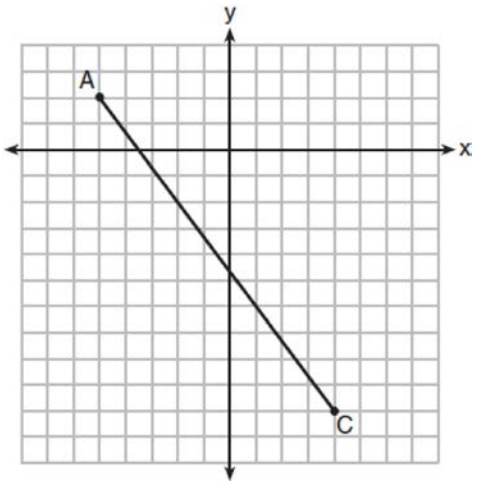
G.GPE.B.6 Directed Line Segments 1b

1 In the diagram below, $\overline{AC}$ has endpoints with coordinates $A(-5,2)$ and $C(4,-10)$.



If B is a point on $\overline{AC}$ and $AB:BC = 1:2$, what are the coordinates of B?

2 What are the coordinates of point C on the directed segment from $A(-8,4)$ to $B(10,-2)$ that partitions the segment such that $AC:CB$ is 2:1?

3 The coordinates of the endpoints of $\overline{QS}$ are $Q(-9,8)$ and $S(9,-4)$. Point R is on $\overline{QS}$ such that $QR:RS$ is in the ratio of 1:2. What are the coordinates of point R?

4 The coordinates of the endpoints of $\overline{SC}$ are $S(-7,3)$ and $C(2,-6)$. If point M is on $\overline{SC}$, what are the coordinates of M such that $SM:MC$ is 1:2?

5 Point M divides $\overline{AB}$ so that $AM:MB = 1:2$. If A has coordinates $(-1,-3)$ and B has coordinates $(8,9)$, the coordinates of M are

6 The endpoints of directed line segment PQ have coordinates of $P(-7,-5)$ and $Q(5,3)$. What are the coordinates of point A, on $\overline{PQ}$, that divide $\overline{PQ}$ into a ratio of 1:3?

7 The endpoints of $\overline{AB}$ are $A(-5,3)$ and $B(7,-5)$. Point P is on $\overline{AB}$ such that $AP:PB = 3:1$. What are the coordinates of point P?

8 Point Q is on $\overline{MN}$ such that $MQ:QN = 2:3$. If M has coordinates $(3,5)$ and N has coordinates $(8,-5)$, the coordinates of Q are

9 Directed line segment AJ has endpoints whose coordinates are $A(5,7)$ and $J(-10,-8)$. Point E is on $\overline{AJ}$ such that $AE:EJ$ is $2:3$. What are the coordinates of point E?

10 Line segment RW has endpoints $R(-4,5)$ and $W(6,20)$. Point P is on $\overline{RW}$ such that $RP:PW$ is 2:3. What are the coordinates of point P?

11 Directed line segment DE has endpoints $D(-4,-2)$ and $E(1,8)$. Point F divides $\overline{DE}$ such that $DF:FE$ is 2:3. What are the coordinates of F?

12 The coordinates of the endpoints of directed line segment ABC are $A(-8,7)$ and $C(7,-13)$. If $AB:BC = 3:2$, the coordinates of B are

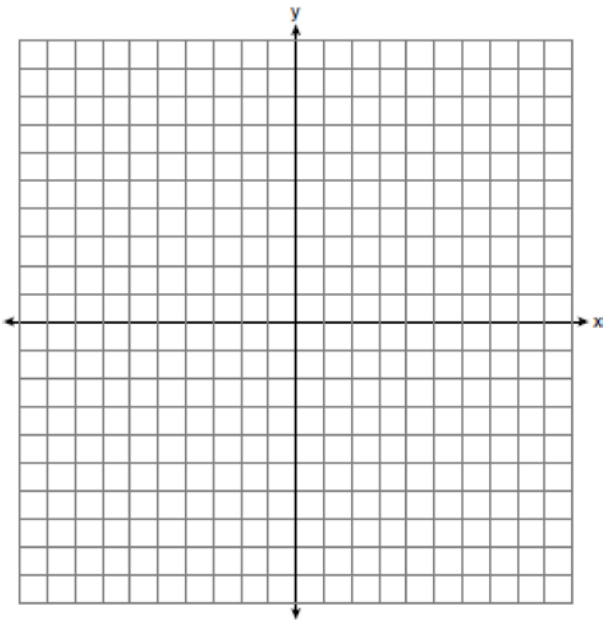
13 Point P divides the directed line segment from point $A(-4,-1)$ to point $B(6,4)$ in the ratio 2:3. The coordinates of point P are

14 What are the coordinates of the point on the directed line segment from $K(-5,-4)$ to $L(5,1)$ that partitions the segment into a ratio of 3 to 2?

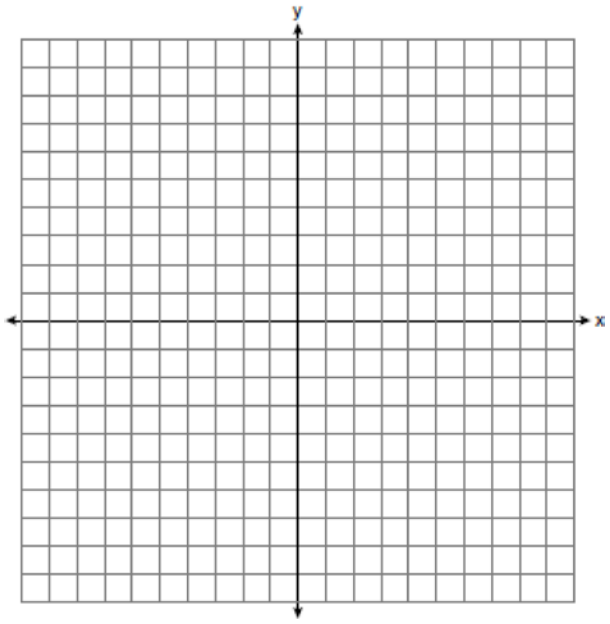
15 Point P is on the directed line segment from point $X(-6,-2)$ to point $Y(6,7)$ and divides the segment in the ratio $1:5$. What are the coordinates of point P?

16 The coordinates of the endpoints of $\overline{AB}$ are $A(-8,-2)$ and $B(16,6)$. Point P is on $\overline{AB}$. What are the coordinates of point P, such that $AP{:}PB$ is 3:5?

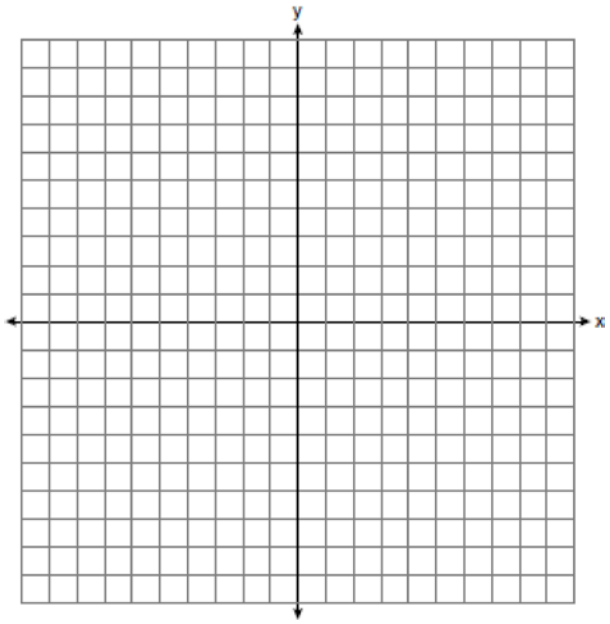
17 The coordinates of the endpoints of $\overline{AB}$ are $A(-6,-5)$ and $B(4,0)$. Point P is on $\overline{AB}$. Determine and state the coordinates of point P, such that $AP:PB$ is $2:3$. [The use of the set of axes below is optional.]



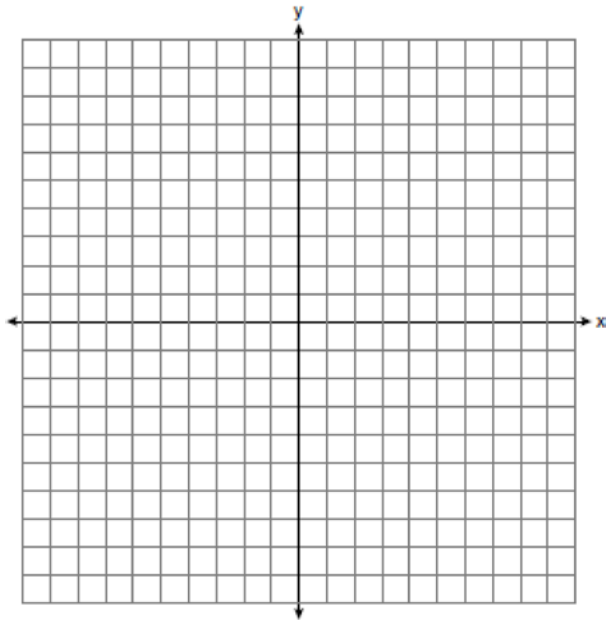
18 Line segment PQ has endpoints $P(-5,1)$ and $Q(5,6)$, and point R is on $\overline{PQ}$. Determine and state the coordinates of R, such that $PR:RQ = 2{:}3$. [The use of the set of axes below is optional.]



19 Directed line segment PT has endpoints whose coordinates are $P(-2,1)$ and $T(4,7)$. Determine the coordinates of point J that divides the segment in the ratio 2 to 1. [The use of the set of axes below is optional.]



20 Directed line segment AB has endpoints whose coordinates are $A(-2,5)$ and $B(8,-1)$. Determine and state the coordinates of P, the point which divides the segment in the ratio 3:2. [The use of the set of axes below is optional.]



21 The endpoints of $\overline{DEF}$ are $D(1,4)$ and $F(16,14)$. Determine and state the coordinates of point E, if $DE:EF = 2:3$.

22 Point P is on segment AB such that $AP:PB$ is $4:5$. If A has coordinates $(4,2)$, and B has coordinates $(22,2)$, determine and state the coordinates of P.

G.GPE.B.6 Directed Line Segments 1b
Answer Section

1 ANS:
$(-2,-2)$

$x = -5 + \frac{1}{3}(4 - -5) = -5 + 3 = -2 \quad y = 2 + \frac{1}{3}(-10 - 2) = 2 - 4 = -2$

REF: 011806geo

2 ANS:
$(4,0)$

$-8 + \frac{2}{3}(10 - -8) = -8 + \frac{2}{3}(18) = -8 + 12 = 4 \;\; 4 + \frac{2}{3}(-2 - 4) = 4 + \frac{2}{3}(-6) = 4 - 4 = 0$

REF: 061919geo

3 ANS:
$(-3,4)$

$-9 + \frac{1}{3}(9 - -9) = -9 + \frac{1}{3}(18) = -9 + 6 = -3 \;\; 8 + \frac{1}{3}(-4 - 8) = 8 + \frac{1}{3}(-12) = 8 - 4 = 4$

REF: 081903geo

4 ANS:
$(-4,0)$

$-7 + \frac{1}{3}(2 - -7) = -7 + \frac{1}{3}(9) = -7 + 3 = -4 \;\; 3 + \frac{1}{3}(-6 - 3) = 3 + \frac{1}{3}(-9) = 3 - 3 = 0$

REF: 082213geo

5 ANS:
$(2,1)$

$-1 + \frac{1}{3}(8 - -1) = -1 + \frac{1}{3}(9) = -1 + 3 = 2 \;\; -3 + \frac{1}{3}(9 - -3) = -3 + \frac{1}{3}(12) = -3 + 4 = 1$

REF: 011915geo

6 ANS:
$A(-4,-3)$

$-7 + \frac{1}{4}(5 - -7) = -7 + \frac{1}{4}(12) = -7 + 3 = -4 \;\; -5 + \frac{1}{4}(3 - -5) = -5 + \frac{1}{4}(8) = -5 + 2 = -3$

REF: 012005geo

7 ANS:
$(4,-3)$

$-5 + \frac{3}{4}(7 - -5) = -5 + \frac{3}{4}(12) = -5 + 9 = 4 \;\; 3 + \frac{3}{4}(-5 - 3) = 3 + \frac{3}{4}(-8) = 3 - 6 = -3$

REF: 082302geo

8 ANS:
$(5,1)$

$3+\frac{2}{5}(8-3)=3+\frac{2}{5}(5)=3+2=5 \;\; 5+\frac{2}{5}(-5-5)=5+\frac{2}{5}(-10)=5-4=1$

REF: 011720geo

9 ANS:
$(-1,1)$

$5+\frac{2}{5}(-10-5)=5+\frac{2}{5}(-15)=5-6=-1 \;\; 7+\frac{2}{5}(-8-7)=7+\frac{2}{5}(-15)=7-6=1$

REF: 012410geo

10 ANS:
$(0,11)$

$-4+\frac{2}{5}(6--4)=-4+\frac{2}{5}(10)=-4+4=0 \;\; 5+\frac{2}{5}(20-5)=5+\frac{2}{5}(15)=5+6=11$

REF: 061715geo

11 ANS:
$(-2,2)$

$-4+\frac{2}{5}(1--4)=-4+\frac{2}{5}(5)=-4+2=-2 \;\; -2+\frac{2}{5}(8--2)=-2+\frac{2}{5}(10)=-2+4=2$

REF: 061814geo

12 ANS:
$(1,-5)$

$-8+\frac{3}{5}(7--8)=-8+9=1 \;\; 7+\frac{3}{5}(-13-7)=7-12=-5$

REF: 081815geo

13 ANS:
$(0,1)$

$-4+\frac{2}{5}(6--4)=-4+\frac{2}{5}(10)=-4+4=0 \;\; -1+\frac{2}{5}(4--1)=-1+\frac{2}{5}(5)=-1+2=1$

REF: 062222geo

14 ANS:
$(1,-1)$

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

$-5+\frac{3}{5}(10) \qquad -4+\frac{3}{5}(5)$

$-5+6 \qquad\qquad -4+3$

$1 \qquad\qquad -1$

REF: spr1401geo

15 ANS:

$\left(-4,-\frac{1}{2}\right)$

$x = -6 + \frac{1}{6}(6 - -6) = -6 + 2 = -4 \qquad y = -2 + \frac{1}{6}(7 - -2) = -2 + \frac{9}{6} = -\frac{1}{2}$

REF: 081618geo

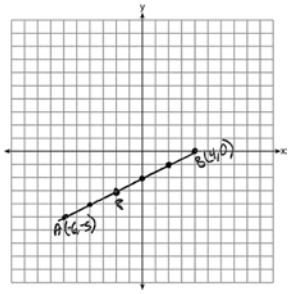
16 ANS:

$(1,1)$

$-8 + \frac{3}{8}(16 - -8) = -8 + \frac{3}{8}(24) = -8 + 9 = 1 \quad -2 + \frac{3}{8}(6 - -2) = -2 + \frac{3}{8}(8) = -2 + 3 = 1$

REF: 081717geo

17 ANS:



$-6 + \frac{2}{5}(4 - -6) \quad -5 + \frac{2}{5}(0 - -5) \quad (-2,-3)$

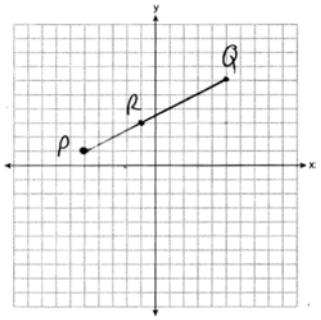
$-6 + \frac{2}{5}(10) \qquad -5 + \frac{2}{5}(5)$

$-6 + 4 \qquad -5 + 2$

$-2 \qquad -3$

REF: 061527geo

18 ANS:



$-5+\frac{2}{5}(5--5)$ $1+\frac{2}{5}(6-1)$ $(-1,3)$

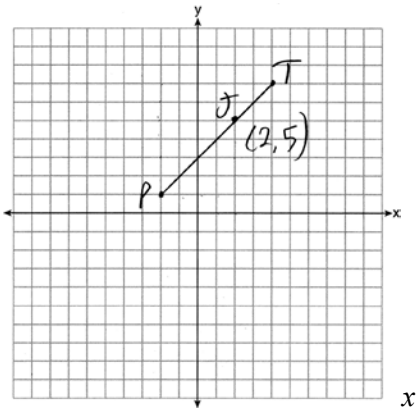
$-5+\frac{2}{5}(10)$ $1+\frac{2}{5}(5)$

$-5+4$ $1+2$

-1 3

REF: 062327geo

19 ANS:

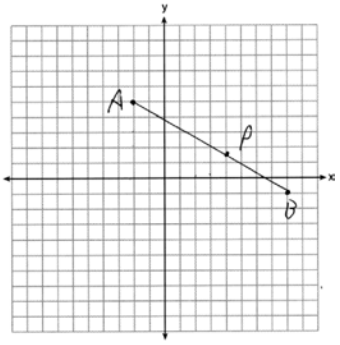


$x=\frac{2}{3}(4--2)=4$ $-2+4=2$ $J(2,5)$

$y=\frac{2}{3}(7-1)=4$ $1+4=5$

REF: 011627geo

20 ANS:



$x = -2 + \frac{3}{5}(8+2) = -2 + 6 = 4$

$y = 5 + \frac{3}{5}(-1-5) = \frac{25}{5} - \frac{18}{5} = \frac{7}{5}$

REF: 012328geo

21 ANS:

$\frac{2}{5} \cdot (16-1) = 6 \quad \frac{2}{5} \cdot (14-4) = 4 \quad (1+6, 4+4) = (7,8)$

REF: 081531geo

22 ANS:

$4 + \frac{4}{9}(22-4) \quad 2 + \frac{4}{9}(2-2) \quad (12,2)$

$4 + \frac{4}{9}(18) \qquad 2 + \frac{4}{9}(0)$

$4 + 8 \qquad 2 + 0$

$12 \qquad 2$

REF: 061626geo