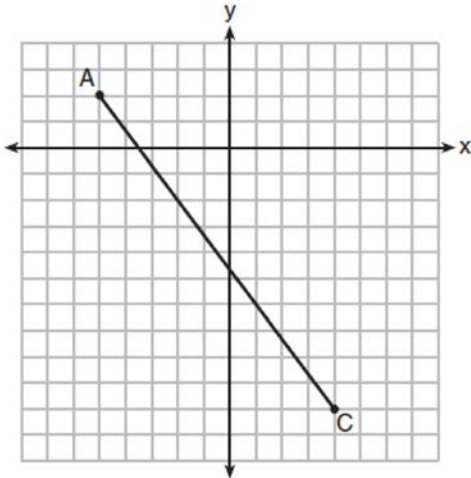## G.GPE.B.6 Directed Line Segments 1

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?
1) $(-2,-2)$
2) $\left(-\dfrac{1}{2},-4\right)$
3) $\left(0,-\dfrac{14}{3}\right)$
4) $(1,-6)$

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?
1) $(1,1)$
2) $(-2,2)$
3) $(2,-2)$
4) $(4,0)$

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?
1) $(0,2)$
2) $(3,0)$
3) $(-3,4)$
4) $(-6,6)$

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?
1) $(-4,0)$
2) $(0,-4)$
3) $(-1,-3)$
4) $\left(-\dfrac{5}{2},-\dfrac{3}{2}\right)$

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
1) $(2,1)$
2) $\left(\dfrac{5}{3},0\right)$
3) $(5,5)$
4) $\left(\dfrac{23}{3},8\right)$

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?
1) $A(-1,-1)$
2) $A(2,1)$
3) $A(3,2)$
4) $A(-4,-3)$

7   Line segment APB has endpoints $A(-5,4)$ and
$B(7,-4)$. What are the coordinates of P if $AP:PB$
is in the ratio $1:3$?
1)   (-2,2)
2) $(-1,1.3)$
3) $(1,0)$
4) $(4,-2)$

8   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?
1) $(-2,-3)$
2) $(1,-1)$
3) $(-2,1)$
4) $(4,-3)$

9   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
1) $(5,1)$
2) $(5,0)$
3) $(6,-1)$
4) $(6,0)$

10 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?
1) $(1,-1)$
2) $(-5,-3)$
3) $(-4,-2)$
4) $(-1,1)$

11 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?
1) $(2,9)$
2) $(0,11)$
3) $(2,14)$
4) $(10,2)$

12 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?
1) (-3.0)
2) $(-2,2)$
3) $(-1,4)$
4) $(2,4)$

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
1) $(-1,1)$
2) $(0,1)$
3) $(1,0)$
4) $(2,2)$

14 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
1) $(1,-5)$
2) $(-2,-1)$
3) $(-3,0)$
4) $(3,-6)$

15 Directed line segment KC has endpoints $K(-4,-2)$
and $C(1,8)$. Point E divides $\overline{KC}$ such that $KE:EC$
is $3:2$. What are the coordinates of point E?
1) $(-1,4)$
2) $(-2,2)$
3) $(-3,0)$
4) $(0,6)$

16 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?
1) $(-3,-3)$
2) $(-1,-2)$
3) $\left(0,-\dfrac{3}{2}\right)$
4) $(1,-1)$

17 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?

1) $\left(4, 5\frac{1}{2}\right)$

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

3) $\left(-4\frac{1}{2}, 0\right)$

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

18 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 $3:5$?

1) $(1,1)$
2) $(7,3)$
3) $(9.6, 3.6)$
4) $(6.4, 2.8)$

19 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.]
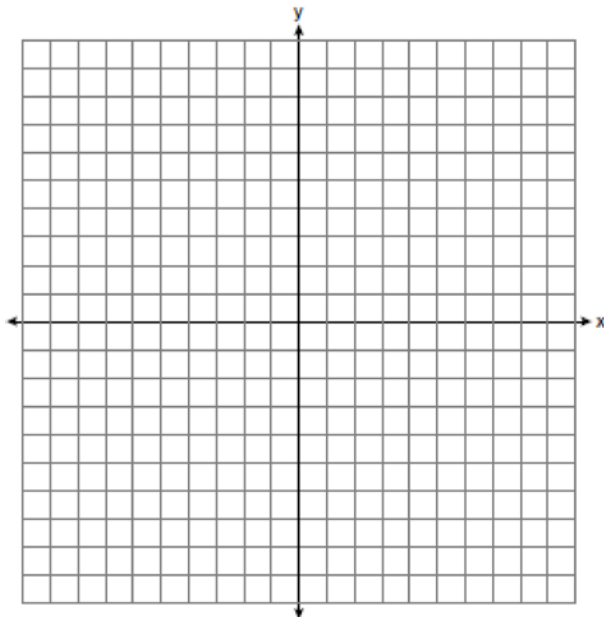
20 Line segment PQ has endpoints $P(-5,1)$ and $Q(5,6)$, and point R is on $\overline{PQ}$. Determine and state the coordinates of R, such that $PR{:}RQ = 2:3$. [The use of the set of axes below is optional.]
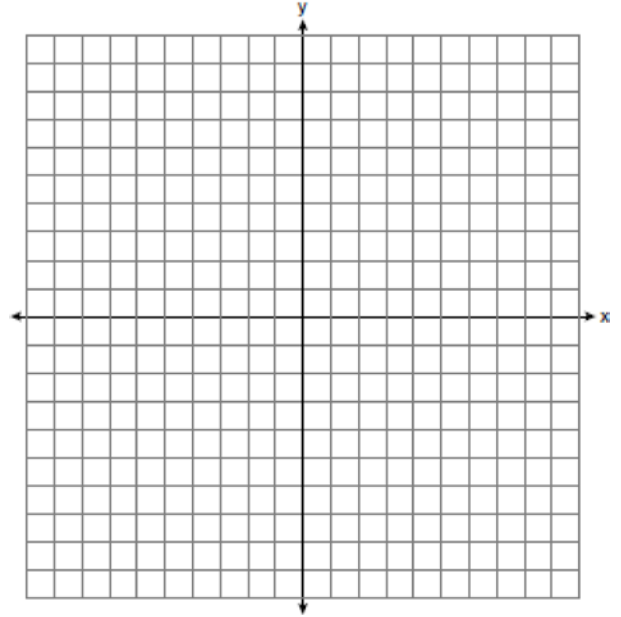
21 Directed line segment *PT* has endpoints whose coordinates are $P(-2,1)$ and $T(4,7)$. Determine the coordinates of point *J* that divides the segment in the ratio 2 to 1. [The use of the set of axes below is optional.]
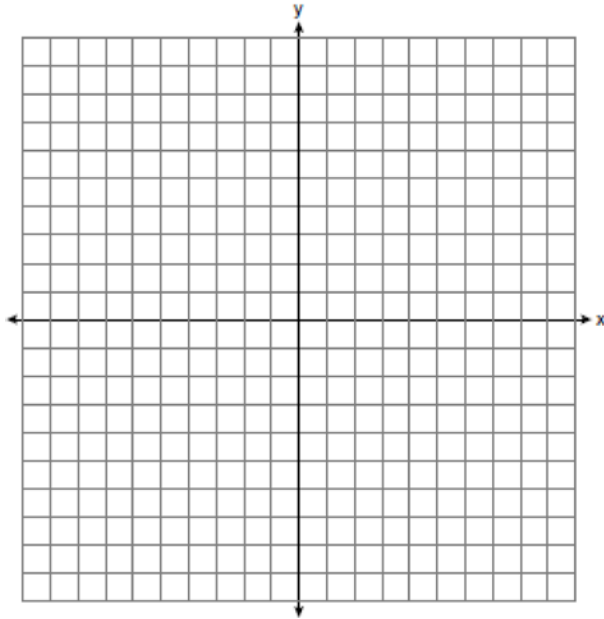
22 Directed line segment *AB* has endpoints whose coordinates are $A(-2,5)$ and $B(8,-1)$. Determine and state the coordinates of *P*, the point which divides the segment in the ratio 3:2. [The use of the set of axes below is optional.]
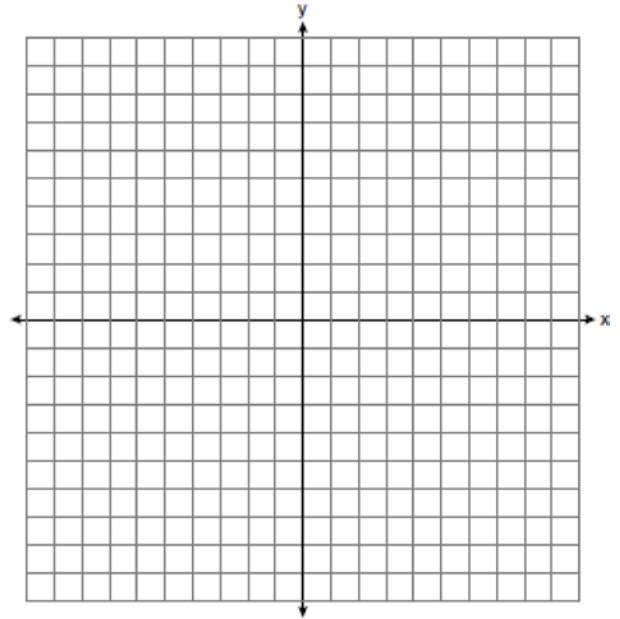
23 The endpoints of $\overline{DEF}$ are $D(1,4)$ and $F(16,14)$. Determine and state the coordinates of point *E*, if $DE:EF = 2:3$.

24 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 1
Answer Section

1 ANS: 1

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

REF: 011806geo

2 ANS: 4

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

REF: 061919geo

3 ANS: 3

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

REF: 081903geo

4 ANS: 1

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

REF: 082213geo

5 ANS: 1

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

REF: 011915geo

6 ANS: 4

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

REF: 012005geo

7 ANS: 1

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

REF: 062418geo

8 ANS: 4

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

REF: 082302geo

9 ANS: 1

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

REF: 011720geo

10 ANS: 4

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

REF: 012410geo

11 ANS: 2

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

REF: 061715geo

12 ANS: 2

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

REF: 061814geo

13 ANS: 2

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

REF: 062222geo

14 ANS: 1

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

REF: 081815geo

15 ANS: 1

$$-4 + \frac{3}{5}(1 - -4) = -4 + 3 = -1 \quad -2 + \frac{3}{5}(8 - -2) = -2 + 6 = 4$$

REF: 082402geo

16 ANS: 4

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

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

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

$$1 \qquad\qquad\quad -1$$

REF: spr1401geo

2

17 ANS: 4

$x = -6 + \dfrac{1}{6}(6 - -6) = -6 + 2 = -4 \quad y = -2 + \dfrac{1}{6}(7 - -2) = -2 + \dfrac{9}{6} = -\dfrac{1}{2}$
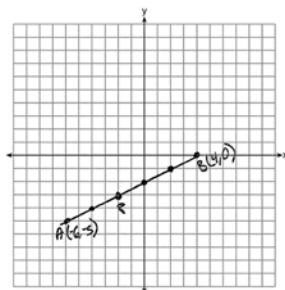
REF: 081618geo

18 ANS: 1

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

REF: 081717geo

19 ANS:

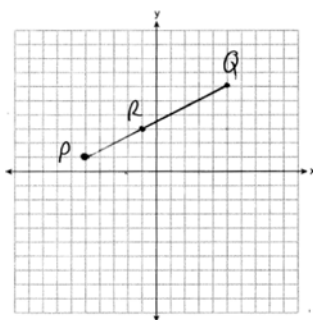$-6 + \dfrac{2}{5}(4 - -6) \quad -5 + \dfrac{2}{5}(0 - -5) \quad (-2, -3)$

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

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

$\qquad\quad -2 \qquad\qquad\quad -3$

REF: 061527geo

20 ANS:

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

$\quad -5 + \dfrac{2}{5}(10) \qquad 1 + \dfrac{2}{5}(5)$

$\qquad -5 + 4 \qquad\qquad 1 + 2$

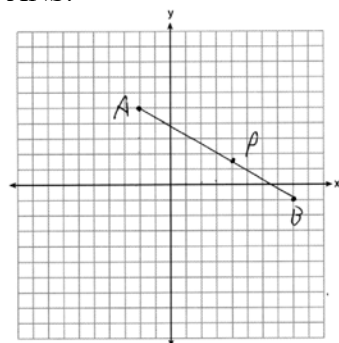$\qquad\quad -1 \qquad\qquad\quad 3$

REF: 062327geo

3

21 ANS:
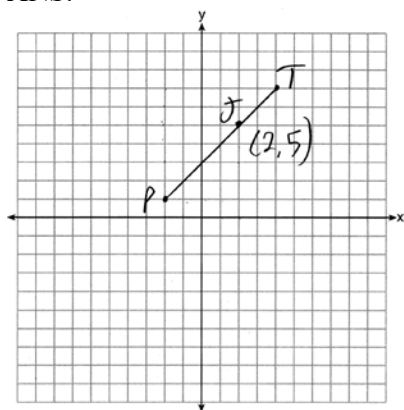
$x = \dfrac{2}{3}(4 - -2) = 4 \quad -2 + 4 = 2 \quad J(2,5)$

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

REF: 011627geo

22 ANS:

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

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

REF: 012328geo

23 ANS:

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

REF: 081531geo

24 ANS:

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

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

$4 + 8$ $2 + 0$

12 2

REF: 061626geo