Partitioning Segments in One Dimension

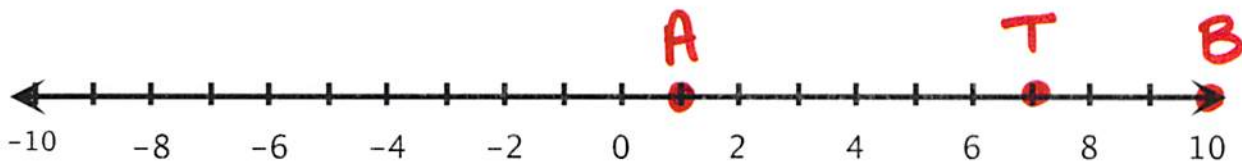Name **Key** Class Period____

Partitioning Segments

$$(x_2 - x_1)\left(\frac{a}{a+b}\right) + x_1$$

1) A is at 1, and B is at 10. Find the point, T, so that T partitions A to B in a 2:1 ratio.

$x_1 = 1$ $x_2 = 10$ $(10-1)\left(\frac{2}{3}\right) + 1 = 9\left(\frac{2}{3}\right) + 1 = 6 + 1$
$$= 7$$

A is at 1 (A), T at 7, B at 10 on number line from −10 to 10.

T is 7 $\frac{6}{3} = \frac{2}{1}$ ✓

2) A is at -2 and B is at 14. Find the point, T, so that T partitions A to B in a 3:1 ratio.

$x_1 = -2$ $x_2 = 14$ $(14+2)\left(\frac{3}{4}\right) - 2 = 16\left(\frac{3}{4}\right) - 2 = 12 - 2$
$$= 10$$

A at −2, T at 10, B at 14 on number line from −6 to 16.

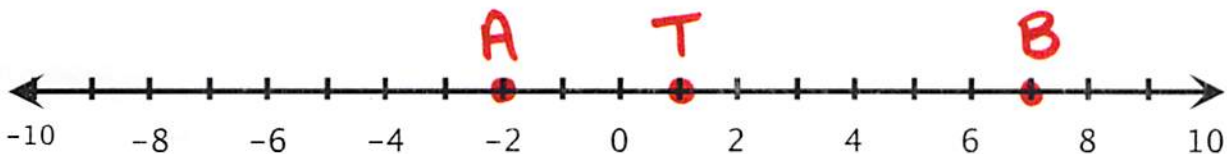**T is 10** $\frac{12}{4} = \frac{3}{1}$ ✓

3) A is at -2 and B is at 7. Find the point, T, so that T partitions A to B in a 1:2 ratio.

$x_1 = -2$ $x_2 = 7$ $(7+2)\left(\frac{1}{3}\right) - 2 = 9\left(\frac{1}{3}\right) - 2 = 3 - 2$
$$= 1$$

A at −2, T at 1, B at 7 on number line from −10 to 10.

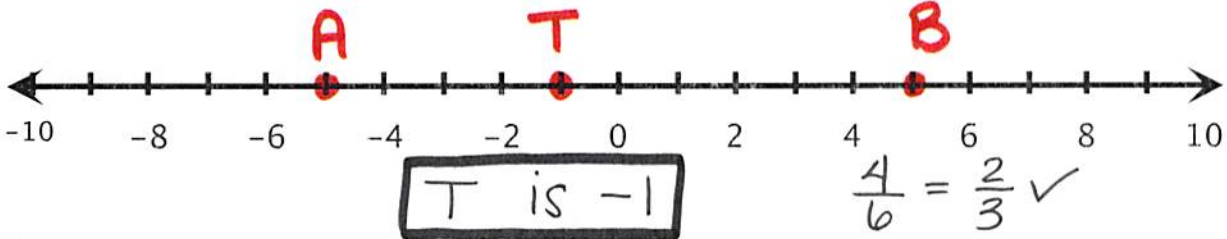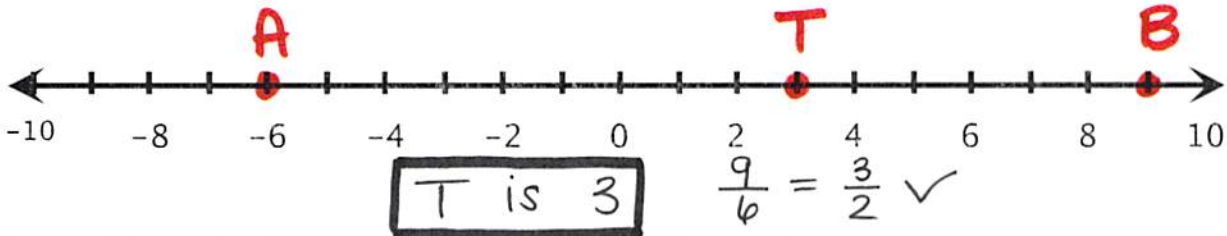**T is 1** $\frac{3}{6} = \frac{1}{2}$ ✓

4) A is at -5 and B is at 5. Find the point, T, so that T partitions A to B in a 2:3 ratio.

$x_1 = -5 \quad x_2 = 5 \qquad (5+5)\left(\frac{2}{5}\right) - 5 = 10\left(\frac{2}{5}\right) - 5 = 4 - 5$
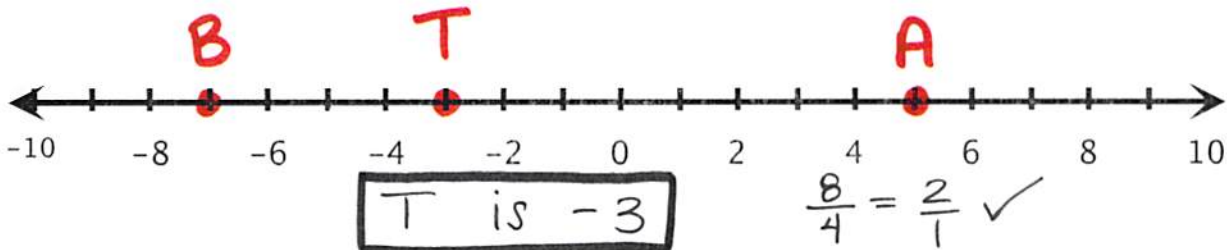
$= -1$

A   T   B

```
<----+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+--->
   -10      -8      -6      -4      -2      0      2      4      6      8      10
```

T is -1

$\frac{4}{6} = \frac{2}{3}$ ✓

5) A is at -6 and B is at 9. Find the point, T, so that T partitions A to B in a 3:2 ratio.

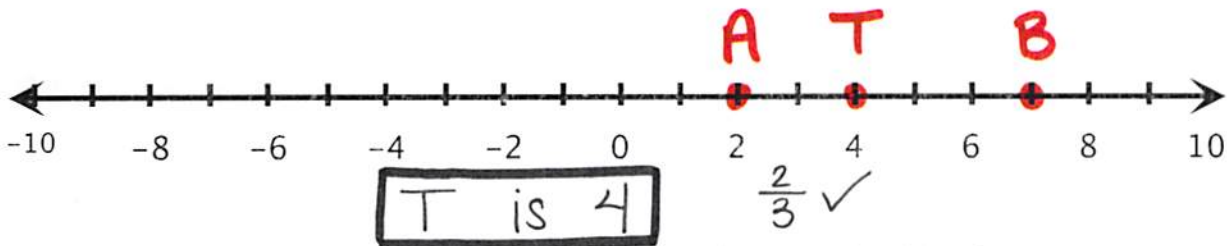$x_1 = -6 \quad x_2 = 9 \qquad (9+6)\left(\frac{3}{5}\right) - 6 = 15\left(\frac{3}{5}\right) - 6 = 9 - 6 = 3$

A   T   B

```
<----+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+--->
   -10      -8      -6      -4      -2      0      2      4      6      8      10
```

T is 3

$\frac{9}{6} = \frac{3}{2}$ ✓

6) A is at 5 and B is at -7. Find the point, T, so that T partitions A to B in a 2:1 ratio.

$x_1 = 5 \quad x_2 = -7 \qquad (-7-5)\left(\frac{2}{3}\right) + 5 = (-12)\left(\frac{2}{3}\right) + 5 = -8 + 5$

$= -3$

B   T   A

```
<----+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+--->
   -10      -8      -6      -4      -2      0      2      4      6      8      10
```

T is -3

$\frac{8}{4} = \frac{2}{1}$ ✓

7) A is at 2 and B is at 7. Find the point, T, so that T partitions A to B in a 2:3 ratio.

$x_1 = 2 \quad x_2 = 7 \qquad (7-2)\left(\frac{2}{5}\right) + 2 = 5\left(\frac{2}{5}\right) + 2 = 2 + 2 = 4$

A T   B

```
<----+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+--->
   -10      -8      -6      -4      -2      0      2      4      6      8      10
```

T is 4

$\frac{2}{3}$ ✓

8) A is at -4 and B is at 10. Find the point, T, so that T partitions A to B in a 3:4 ratio.

$x_1 = -4 \quad x_2 = 10 \qquad (10+4)\left(\frac{3}{7}\right) - 4 = 14\left(\frac{3}{7}\right) - 4 = 6 - 4$

$= 2$

A   T   B

```
<----+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+--->
   -10      -8      -6      -4      -2      0      2      4      6      8      10
```

T is 2

$\frac{6}{8} = \frac{3}{4}$ ✓