Math 4CST – Point of Division Practice

Name: Key

1.

Complete the table below.

	Coordinates of point A	Coordinates of point B	Coordinates of the midpoint of $\overline{AB}$	Coordinates of the point situated $\frac{2}{3}$ along $\overline{AB}$	Coordinates of the point which divides $\overline{AB}$ in a ratio of 2:3
①	(0, 0)	(30, 90)	(15, 45)	(20, 60)	(12, 36)
②	(-6, 38)	(-36, 23)	(-21, 30.5)	(-26, 28)	(-18, 32)
③	(23, 0)	(14, 21)	(18.5, 10.5)	(17, 14)	(19.4, 8.4)
④	(8, -9)	(-12, 4)	(-2, -2.5)	(-5.33, -0.33)	(0, -3.8)
⑤	(11, 10)	(2, 0)	(6.5, 5)	(5, 3.33)	(7.4, 6)
⑥	$(\frac{4}{5}, 6)$	$(\frac{1}{2}, -5)$	(0.65, 0.5)	(0.6, -1.33)	(0.68, 1.6)
⑦	(2, 5)	(10, 13)	(6, 9)	(7.33, 10.33)	(5.2, 8.2)
⑧	(-1, 6)	(-11, 10)	(-6, 8)	(-7.67, 8.67)	(-5, 7.6)

② $x = -6 + \frac{2}{3}(-36+6)$
$= -6 + \frac{2}{3}(-30)$
$= -6 - 20$

$y = 38 + \frac{2}{3}(23-38)$
$= 38 + \frac{2}{3}(-15)$
$= 38 - 10$

② $x = -6 + \frac{2}{5}(-30)$
$= -6 + -12$
$= -18$

$y = 38 + \frac{2}{5}(-15)$
$= 32$

③ $x = 23 + \frac{2}{3}(14-23)$
$= 23 + \frac{2}{3}(-9)$
$= 17$

$y = 0 + \frac{2}{3}(21)$
$= 14$

③ $x = 23 + \frac{2}{5}(-9)$
$= 19.4$

$y = 0 + \frac{2}{5}(21)$
$= 8.4$

④ $x = 8 + \frac{2}{3}(-12-8)$
$= -5.33$

$y = -9 + \frac{2}{3}(4--9)$
$= -0.33$

$x = 8 + \frac{2}{5}(-20)$

$y = -9 + \frac{2}{5}(13)$

⑤ $x = 11 + \frac{2}{3}(2-11)$

$y = 10 + \frac{2}{3}(0-10)$

⑥ $x = 0.8 + \frac{2}{3}(0.5-0.8)$

$y = 6 + \frac{2}{3}(-5-6)$

⑦ $x = 2 + \frac{2}{3}(10-2)$

$y = 5 + \frac{2}{5}(13-5)$

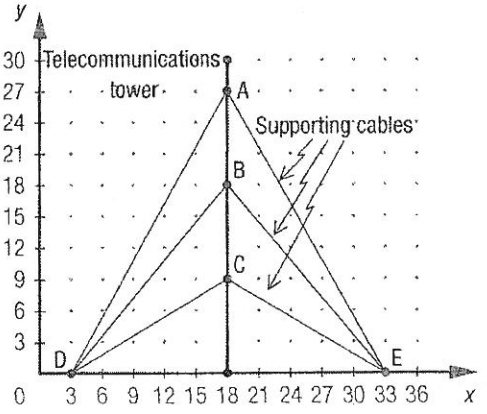
⑧ $x = -1 + \frac{2}{3}(-11--1)$

$y = 6 + \frac{2}{3}(10-6)$

2.

The diagram shown below represents a telecommunications tower maintained by a series of supporting cables. The scale is in metres.

a) Calculate the slope of each of the six cables illustrated.



b) Determine the length of:

1) the two longest cables

2) the two shortest cables

c) Each cable needs an insulator. What are the coordinates of the insulators if:

1) one is located at $\frac{1}{5}$ of $\overline{DC}$ and another at $\frac{1}{5}$ of $\overline{EC}$?

2) one is located at $\frac{2}{5}$ of $\overline{DB}$ and another at $\frac{2}{5}$ of $\overline{EB}$?

3) one divides $\overline{DA}$ in a ratio of 2:1 and another divides $\overline{EA}$ in the same ratio?

3.

Annie wants to move to be as close as possible to her workplace. Her home, A, and her office, B, are represented in the adjacent Cartesian plane.

- A residential building C is located at $\frac{3}{4}$ of the length of $\overline{AB}$.
- A residential building D divides $\overline{AB}$ in a ratio of 2:3.

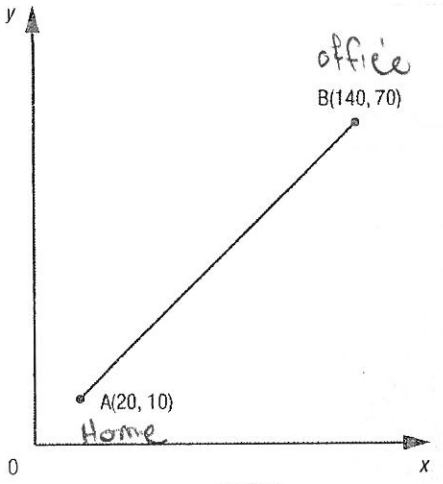
Considering that the scale is in kilometres:

a) Which building should she choose?

C

b) What distance will she travel to get to the office from her new building?

33.54 km.



C (110, 55)

D (68, 34)

$d_{BC} = \sqrt{30^2 + 15^2}$

$= \sqrt{1125}$

$= 33.54 \text{ km}$

$x = 20 + \frac{2}{5}(140 - 20)$

$= 68$

$y = 10 + \frac{2}{5}(70 - 10)$

$= 34$