QUESTION 6

The table below shows the number of houses sold by a real estate company in each quarter of 2018.

Quarter	summer	autumn	winter	spring
Houses sold	3523	2837	2648	3873

Determine the seasonal index for autumn.

(A) 0.822

(B) 0.881

(C) 1.094

(D) 3220.25

QUESTION 7

A sequence is defined by

$$5,\ -18,\ 64.8,\ -233.28,\ 839.808$$

Which of the following is the common ratio between the terms?

(A) $r = -23$

(B) $r = -13$

(C) $r = -3.6$

(D) $r = -0.27$

QUESTION 8

City X is located at $(28°34'\text{S}, 110°18'\text{E})$ and city Y is located at $(28°34'\text{S}, 93°28'\text{W})$.

Determine the shortest distance between city X and city Y.

(A) 2907.29 km

(B) 15 258.16 km

(C) 19 900.39 km

(D) 22 658.85 km

QUESTION 9

The approximate coordinates of Hong Kong are $(21°\text{N}, 114°\text{E})$. The approximate coordinates of Toronto are $(39°\text{N}, 81°\text{W})$. At 3:30 pm Friday in Hong Kong local time, a company in Hong Kong wants to call their Toronto branch.

Determine the equivalent local time in Toronto.

(A) 7:30 pm Friday

(B) 2:30 am Friday

(C) 4:30 am Saturday

(D) 11:30 am Friday

QUESTION 7 C

C is correct. The common ratio for geometric sequences between successive terms is found using:

$$r = \frac{t_2}{t_1} = \frac{t_3}{t_2} = \frac{t_4}{t_3} \ldots$$

$$r = \frac{-18}{5} = \frac{64.8}{-18} = \frac{-233.28}{64.8} = -3.6$$

A is incorrect. This option gives the common difference.

$$t_2 - t_1 = -18 - 5$$
$$= -23$$

B is incorrect. This option gives the incorrect solution.

$$t_2 + t_1 = -18 + 5$$
$$= -13$$

D is incorrect. This option gives the incorrect value of *r*.

$$r = \frac{t_1}{t_2}$$
$$= -0.27$$

QUESTION 8 B

B is correct. City X and city Y are on the same parallel of latitude so the small circle distance formula must be used. The angular distance between the meridians of longitude is found by adding the east and west values:

$110°18' + 93°28' = 203°46'.$

However, as the shortest path between the two cities passes on the opposite side of the world, the angular distance must be subtracted from 360º. So, the shortest angular distance is:

$360° - 203°46' = 156°14'.$

$$D = 111.2 \cos\theta \times \text{angular distance}$$
$$= 111.2 \cos(28°34') \times 156°14'$$
$$= 15258.16 \text{ km}$$

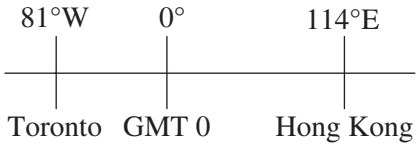
A is incorrect. This option swaps the latitude and angular distance using $D = 111.2 \cos(156°14') \times 28°34'.$

C is incorrect. This option gives the longest distance as the angular distance was not subtracted from 360°.

D is incorrect. This option uses the formula for distance on a great circle, $D = 111.2 \times \text{angular distance}.$

QUESTION 9 B

B is correct. The time zone difference between Hong Kong and Toronto is $81° + 114° = 195°$ and as 1 hour is equal to 15°, the time difference must be $\frac{195°}{15°} = 13 \text{ hours}.$ Hong Kong is ahead of Toronto by 13 hours, so if it is 3:30 pm Friday in Hong Kong then it must be 3:30 pm – 13 hours = 2:30 am Friday in Toronto.



A is incorrect. This option adds 4 hours to Hong Kong's local time. **C** is incorrect. This option adds 13 hours to Hong Kong's local time. **D** is incorrect. This option subtracts 4 hours from Hong Kong's local time.