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Paper 2

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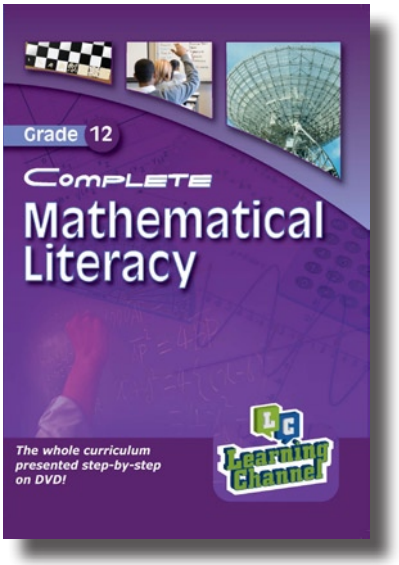
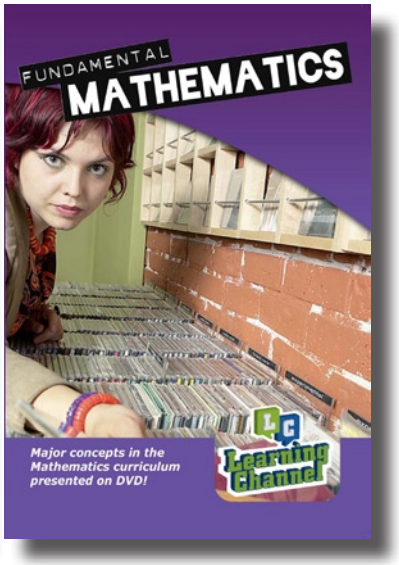




MARKS: 150 **TIME: 3 hours**

QUESTION 1

The costs of tickets for the 2010 FIFA World Cup were listed in both US Dollars and South African rand (source: www.fifa.com).

The table below shows some of the values:

	Prices in US Dollars (US$)				Prices in South African rand (ZAR) including the applicable VAT				
Matches	**Cat. 1**	**Cat. 2**	**Cat. 3**	**Wheelchair**	**Cat. 1**	**Cat. 2**	**Cat. 3**	**Cat. 4****	**Wheelchair**
Opening match (No. 1)	450	300	200	70	3 150	2 100	1 400	490	490
Group matches (No. 2 to 48)	(a)	120	80	20	1 120	840	560	140	140
Round of 16 (No. 49 to 56)	200	150	100	50	1 400	1 050	700	350	350
Quarter-finals (No. 57 to 60)	300	200	150	75	2 100	1 400	1 050	525	525
Semi-finals (No. 61 & 62)	600	400	250	100	4 200	2 800	(b)	700	700
3rd/4th place match (No. 63)	300	200	150	75	2 100	1 400	1 050	525	525
The final (No. 64)	900	600	400	150	6 300	4 200	2 800	1 050	1 050

**Cat. 4 is reserved for South African residents and will be sold exclusively in ZAR.

1.1 Determine the following from the table:

1.1.1 How many US$ does a Cat. 1 ticket for the opening match cost? (2)

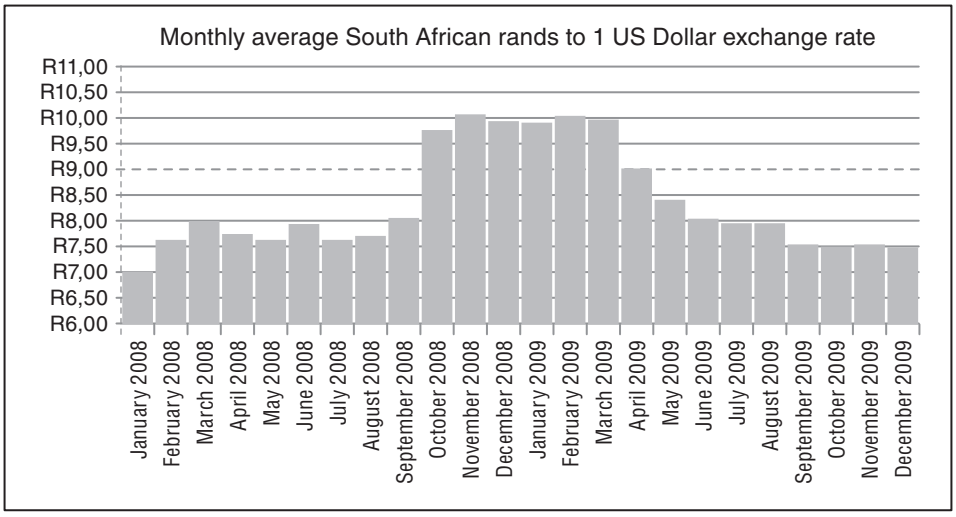
1.1.2 How many ZAR does a Cat. 3 ticket for a quarter final match cost? (2)

1.1.3 Which is the most expensive ticket and how much does it cost (in US$)? (3)

1.1.4 Which is the least expensive ticket that a South African can buy and how much does it cost (in ZAR)? (3)

1.2 Exchange rates

The actual monthly average rand to 1 US$ exchange rate for the period January 2008 to December 2009 (source: www.x-rates.com) is represented by the graph below.



1.2.1 What was the average ZAR to 1 US$ exchange rate for April 2009? (2)

1.2.2 In which month was the average ZAR to 1 US$ exchange rate lowest? (2)

1.2.3 In which month was the average ZAR to 1 US$ exchange rate highest? (2)

1.2.4 What is the rand to US$ exchange rate that has been used by FIFA in developing the ticket cost table at the start of the question? Show how you determined your answer. (4)

1.2.5 Use the exchange rate that you have determined in 1.2.4 to calculate the values of (a) and (b) in the table. (4)

1.3 By comparing the actual exchange rate for the period January 2008 to December 2009 and the exchange rate used by FIFA in determining the ticket prices, discuss whether or not South Africans have been advantaged or disadvantaged. Remember to justify your answer as fully as possible. (6)

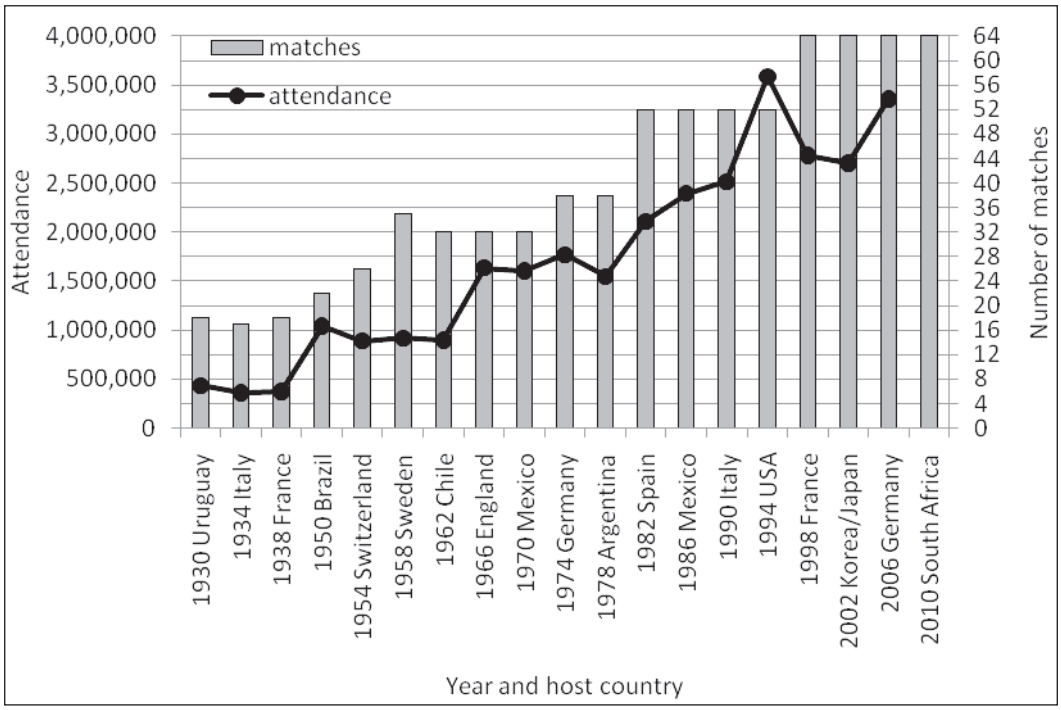
[30]

QUESTION 2

One of the challenges of planning for the World Cup is estimating the number of spectators that will attend the tournament.

The graph below shows the actual number of tickets sold (attendance) for each of the World Cup tournaments since the 1930 tournament in Uruguay.

The graph also shows the number of matches that were played in each tournament.



2.1 Determine the following from the graph:

2.1.1 How many World Cup tournaments have there been before the 2010 tournament in South Africa? (2)

2.1.2 Which country hosted the tournament in 1982? (2)

2.1.3 How many matches were there in the 1962 tournament in Chile? (2)

2.1.4 Approximately how many tickets were sold during the 1990 tournament in Italy? (2)

2.1.5 Estimate the average number of tickets (attendance) per match during the 2002 tournament in Korea/Japan? (4)

2.2 Match attendance

2.2.1 What impression does the line graph create regarding ticket sales (attendance) at the World Cup? Explain how you have determined your answer. (4)

2.2.2 Describe what has happened to the number of matches in each tournament over the history of the tournament. (4)

2.2.3 Estimate the average match attendance for each of the following tournaments:

(a) 1950 Brazil

(b) 1966 England

(c) 1994 USA

(d) 2006 Germany. (8)

2.2.4 Discuss the trend in average match attendance. (2)

2.2.5 Estimating the actual number of tickets to be sold per tournament as well as the number of tickets to be sold per match is important for planning purposes.

Discuss the importance of each of these figures by suggesting different people who would be interested in each of the different values. (4)

[34]

QUESTION 3

Abadom, a Nigerian fan, is planning to follow his team through the group matches. Nigeria has been drawn in Group B. The table below gives the match fixtures for Group B.

Date — Time	Venue	Match
12/06 16:00	Johannesburg – JEP	Argentina vs. Nigeria
12/06 13:30	Nelson Mandela Bay – Port Elizabeth	Korea Republic vs. Greece
17/06 16:00	Mangaung – Bloemfontein	Greece vs. Nigeria
17/06 13:30	Johannesburg – JSC	Argentina vs. Korea Republic
22/06 20:30	Durban	Nigeria vs. Korea Republic
22/06 20:30	Polokwane	Greece vs. Argentina

JUNE 2010						
Mon	**Tue**	**Wed**	**Thu**	**Fri**	**Sat**	**Sun**
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

3.1 Determine the following from the information provided:

3.1.1 In which city does Nigeria play its first match? (2)

3.1.2 On what date and at what time does Nigeria play its second match? (2)

3.1.3 Who is Nigeria's opponent in the third match? (2)

3.1.4 On what day of the week does Nigeria play against Greece? (2)

3.1.5 Make a list of the cities that Abadom must travel to and the order in which he must visit them in order to follow his team. (4)

Abadom has decided to travel from one city to the next by train. He has the following information about the trains that he might use.

Town	Dep	Dep	Town	Dep	Dep	Town	Dep	Dep	Town	Dep	Dep
Johannesburg – East London			**Johannesburg – Port Elizabeth**			**Johannesburg – Bloemfontein**			**Durban – Cape Town**		
Daily except Wed. and Sun.			**Daily expect Tue. and Sat.**			**Wed.; Fri.; and Sun.**			**DBN-CPT: Wed. CPT-DBN: Mon**		
Train number:	74205	47206	Train number:	73011	37012	Train number:	75036	57035	Train number:	16001	61002
Johannesburg	14:20	10:50	Johannesburg	13:15	11:35	Johannesburg	19:40	08:10	Durban	18:30	08:00
Germiston	14:52	10:27	Germiston	13:48	11:12	Krugersdorp	20:23	05:17	Pietermaritzburg	21:00	05:55
Vereeniging	16:02	09:29	Vereeniging	14:58	10:10	Randfontein	20:41	05:00	Ladysmith	01:00	02:05
Sasolburg	16:33	09:29	Sasolburg	15:29	09:42	Oberholzer	21:24	04:10	Harrismith	03:53	23:45
Kroonstad	18:35	07:12	Kroonstad	17:30	07:54	Potchefstroom	22:28	03:02	Bethlehem	05:40	21:45
Henneman	19:13	06:20	Henneman	18:08	07:02	Klerksdorp	23:28	02:10	Kroonstad	08:20	19:07
Virginia	19:32	06:00	Virginia	18:26	06:42	Bloemhof	01:42	23:39	Henneman	09:00	18:03
Brandfort	20:33	04:57	Brandfort	19:28	05:39	Christiana	02:32	22:51	Virginia	09:20	17:45
Bloemfontein	21:36	04:08	Bloemfontein	20:30	04:50	Warrenton	03:06	22:17	Brandfort	10:26	16:45
Springfontein	00:43	00:40	Springfontein	23:15	01:10	Kimberley	04:50	21:15	Bloemfontein	11:45	16:00
Bethulie	01:30	23:23	Colesburg	01:20	23:19	Bloemfontein	07:45	18:00	Kimberley	15:15	12:45
Burgersdorp	03:05	21:56	Noupoort	02:35	22:29				Oranjerivier	17:32	10:05
Molteno	04:08	20:42	Rosemead	03:28	21:17	**Johannesburg – Durban**			De Aar	19:40	08:40
Queenstown	06:10	19:00	Cradock	04:44	19:32	**Daily except Tue. and Sat.**			Hutchinson	21:41	06:20
Cathcart	07:20	17:24	Cookhouse	05:57	18:23	Train number:	76009	67010	Beaufort West	23:50	04:30
Stutterheim	08:34	16:12	Alicedale	07:23	16:47	Johannesburg	18:30	07:44	Prince Albert Road	01:29	02:15
Berlin	09:34	15:02	Port Elizabeth	09:15	15:00	Germiston	19:03	07:23	Laingsburg	02:57	00:50
East London	10:20	14:15				Standerton	21:20	05:10	Touwsrivier	04:17	23:30
						Newcastle	23:30	02:40	Worcester	05:45	22:15
						Ladysmith	01:31	00:42	Wellington	07:18	20:20
						Pietermaritzburg	04:58	21:36	Huguenot	07:32	20:04
						Durban	07:10	19:15	Bellville	08:17	19:20
									Cape Town	08:45	18:50

NOTES:

- The left-hand column shows the departure times from each station on the journey described in the title (e.g. Johannesburg – East London). This must be read from top to bottom.
- The right-hand column shows the departure times from each station on the opposite journey (i.e. East London to Johannesburg for the Johannesburg – East London route). This column must be read from the bottom up.
- The last (highlighted) time in each column is the arrival time at the final destination.

3.2 Answer the following questions based on the train timetable for train number 61002 (Cape Town to Durban):

3.2.1 On what day of the week does the train leave Cape Town? (2)

3.2.2 At what time of day does the train leave Cape Town? (2)

3.2.3 At what time and on what day of the week does the train reach Bloemfontein? (2)

3.2.4 At what time and on what day of the week does the train reach Durban? (2)

3.2.5 Discuss, with reasons, whether or not Abadom can use this train to get from Bloemfontein to Durban to watch the Durban match. (6)

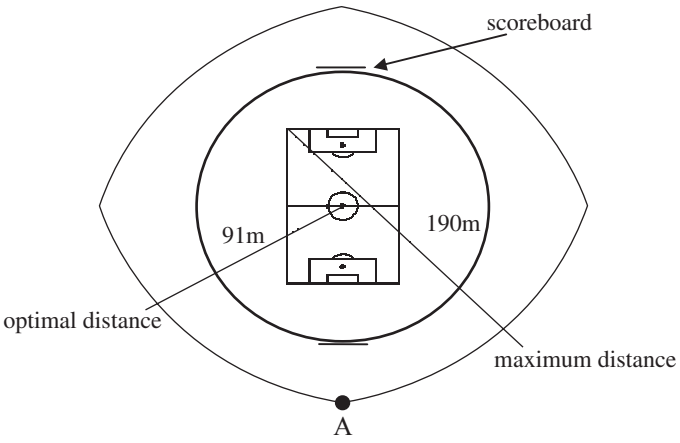
3.3 Determine an itinerary for a journey using the trains that Abadom can use to get from JHB to Bloemfontein to Durban and back to Johannesburg again. Your solution must meet the following criteria:

- Abadom cannot leave a town until well after the match is over.
- Abadom must arrive in each town with time to spare before the match starts.
- Your solution must provide:

- Train numbers
- Dates and times of departure from each city
- Dates and times of arrival in each city. (15)

[41]

QUESTION 4



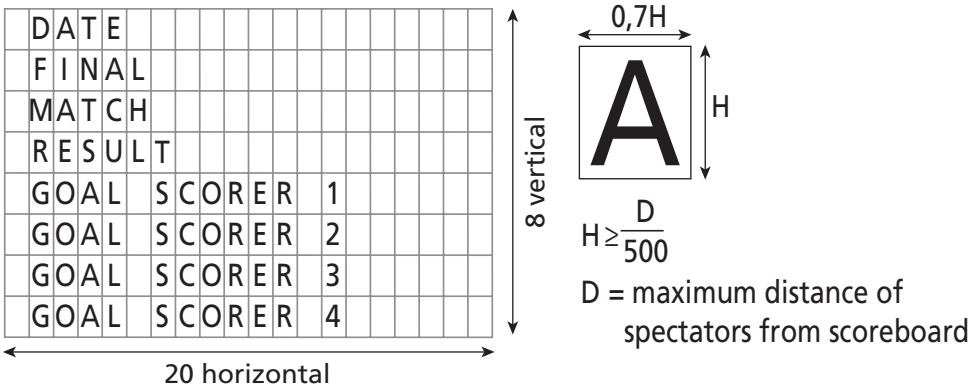
In order to host the FIFA world cup a host nation needs to have or must build appropriate stadiums. FIFA provides very clear guidelines regarding the dimensions and design of such stadiums. The diagram above comes from the FIFA guidelines for stadium design. The diagram shows both the ideal distance for spectators from the centre of the field and the maximum distance that any spectator should sit from the furthest corner of the field.

4.1 Determine the following from the diagram:

4.1.1 What, according to FIFA, is the optimal distance for a spectator to sit from the centre point of the field? (2)

4.1.2 What, according to FIFA, is the maximum distance that a spectator should sit from the furthest corner of the field? (2)

4.2 The diagram above has been drawn according to scale. Using your ruler and the dimensions provided on the diagram estimate, to the nearest 10 m, the distance that a spectator at point A will sit from the scoreboard on the opposite side of the field. (8)



4.3 FIFA has developed the diagram and formula above to help tournament hosts with the development of scoreboards. Assume that in a particular stadium the maximum distance of a spectator from the scoreboard is 220 m. Use the formula provided by FIFA to calculate the minimum dimensions of:

4.3.1 H in metres. (4)

4.3.2 The scoreboard in metres. (4)

[20]

QUESTION 5

It is human nature to want to make predictions, and it is no less so with the 2010 World Cup. Long before the tournament even started, people already predicted who will win. That is not to say that everybody agreed.

One place in which these predictions manifest themselves is in sports betting. Bookmakers offer odds on each of the different teams winning the tournament. People (punters) place bets with the bookmakers and, if they are correct, then they get paid out according to the odds of the bet. If they are wrong they lose their bet.

For example, a bookmaker offers odds of 15–1 (we say: "fifteen to one") on a particular team winning. A punter places a R5 bet on that team. The team wins. The punter will be paid out R5 × 15 = R75 plus the R5 bet that he/she placed: total payout = R5 + R75 = R80.

At the end of February 2010, the odds for each of the teams winning the tournament that one bookmaker offered were:

Country	Odds	Country	Odds	Country	Odds	Country	Odds
Algeria	250–1	France	14–1	Mexico	80–1	Slovakia	200–1
Argentina	9–1	Germany	12–1	Netherlands	12–1	Slovenia	200–1
Australia	100–1	Ghana	50–1	New Zealand	1500–1	South Africa	100–1
Brazil	5–1	Greece	125–1	Nigeria	100–1	South Korea	300–1
Cameroon	80–1	Honduras	500–1	North Korea	1500–1	Spain	9–2
Chile	50–1	Italy	11–1	Paraguay	66–1	Switzerland	200–1
Denmark	100–1	Ivory Coast	25–1	Portugal	28–1	Uruguay	100–1
England	11–2	Japan	300–1	Serbia	50–1	USA	50–1

5.1 Answer the following questions based on the information in the table:

5.1.1 What odds does the bookmaker offer for Ghana winning? (2)

5.1.2 What odds does the bookmaker offer for Uruguay winning? (2)

5.2 Consider the Netherlands. The odds the bookmaker offers for the Netherlands winning are 12–1.

5.2.1 What would be the total payout for a bet of R25 if the Netherlands won the tournament? (6)

5.2.2 What amount would a person have bet if the Netherlands won and they were paid out a total of R2 080 for their bet on the team? (6)

5.3 According to the odds:

5.3.1 Which team is least likely to win the tournament? Justify your answer. (3)

5.3.2 Which team is most likely to win the tournament? Justify your answer (3)

5.3.3 What chance does the bookmaker give South Africa of winning the tournament? Explain your answer. (3)

[25]