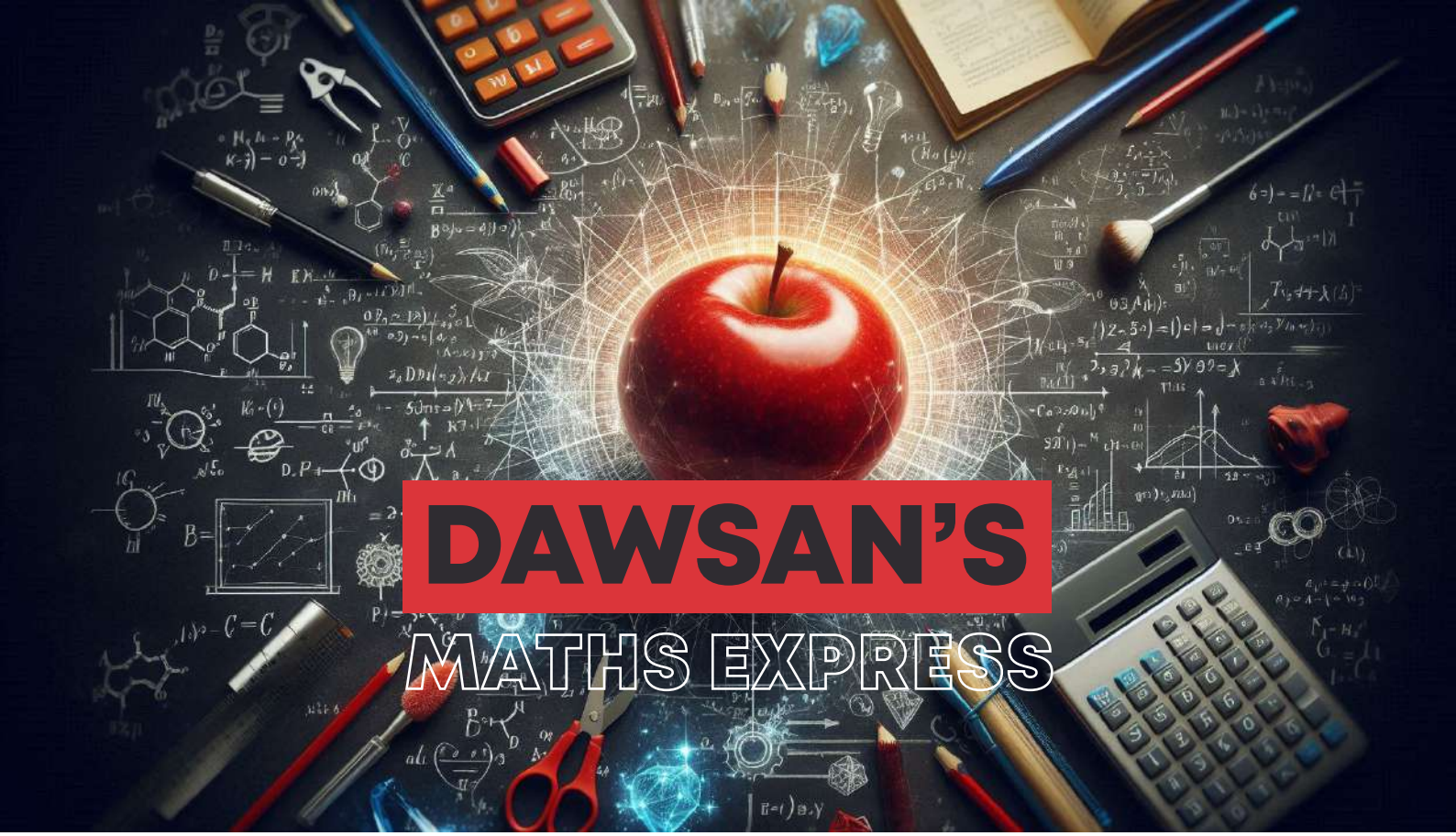


S.Edwards and D.Williams

Africa Maths Challenge

NAME

DAWSAN'S
Maths
EXPRESS

S. Edwards & D. Williams

These fun calculations are devised
to be to be used in conjunction with the
Dawsan's Maths Dictionary.

In this mini-assignment you will be striving to get to the grand prize of "R1 000 000"! In order to achieve this you need to answer 100 questions and score 100%, in the allocated time period!

There are 20 rounds each with 5 questions. Each round starts with a question that is related to the continent of Africa, the following 4 questions are Maths related. At the back of your booklet you will find a "Resources" section which will help you to locate the answers to the questions on Africa. You may use calculators and your Dawsan's Maths dictionary to assist you with the maths questions. The questions follow-on i.e. you must use your previous answer to work out the next question. Once you have completed the 5 questions in the round you must use the values for each of your answers to complete an equation. If the equation balances, you are correct and may proceed to the next round. If not, go back and check your answers. Remember you must always apply the rule for the order of operations.

Example Round:

a) If Dodoma is the capital of Tanzania start with a gross. If not, start with a great gross.

b) …. + the product of 12 and 17	= 144 + (12 x 17)	= 144 + 204	= 348
c) …. ÷ 4th counting number	= 348 ÷ 3		= 116
d) …. + the number of months with 30 days		= 116 + 4	= 120
e) …. – VIII	= 120 – 8		= 112

EQUATION: c + d + e = b	**116 + 120 + 112 = 348 = 348**	√

Get ready to start!

↓

GO!

Round 1:

a) If the equator passes through 7 African countries start with the 5th multiple of 6. If not, start with the 7th multiple of 6. (Reference: Resources 2) _____

b) ……. x 1st prime number _____

c) ……. + the number of sides on (1 hexagon + 2 pentagons) _____

d)……. ÷ the number of years in a decade. _____

e) ……. + the **second** composite number _____

EQUATION: a + b = c + d + e _____

Round 2:

a) If Chad is bordered by 6 countries start with a score. If not, start with the number of minutes in half an hour. _____

b) ……. + number of degrees in a triangle _____

c) ……. – 5 dozen _____

d) …… x the 2nd prime number _____

e) ……– CCCLX _____

EQUATION: a + b + c = d – e _____

Round 3:

a) The names of how many of these capital cities are spelled incorrectly? _____
Dijbouti; Naimey; Kinshasha; Bamoko; Luanda; Noukchott; Rabat; Gabarone; Accra

b) ……. x number of months with 31 days _____

c) ……. + number of years in half a millennium _____

d) ……. – number of degrees in a revolution _____

e) ……. – (10 x 7) + (1 x 4) _____

EQUATION: a x b + e = c - d _____

Round 4:

a) The names of how many countries **on the continent** of Africa start with the letter "M"? Multiply this by the number of letters in the spelling of the **capital city** of Burkina Faso. _____

b) ……. + number of minutes from 8:55 to 9:10 _____

c) …… + 2 x 2 x 2 x 2 _____

d) …… – the 15th prime number _____

e) ……. x half a dozen + (6 + 8 x 2) _____

EQUATION: c – b = a – d = $\sqrt{e}$ _____

Round 5:

a) If you travelled in a north-westerly direction from Khartoum (Sudan) to Kinshasa (Democratic Republic of the Congo), start with $\frac{3}{4}$ of 120. If not, start with $\frac{1}{2}$ of 250. _____

b) ……. + number of millilitres in half a litre _____

c) ……. ÷ 25 – 2 x 10 _____

d) ……. x the number of Snow White's dwarfs _____

e) ……. – L.C.M of 4 and 7 _____

EQUATION: b ÷ a = d ÷ e = c _____

Round 6:

a) If Libya has the longest coastline on the Mediterranean Sea start with CCL. If not, start with CL. _____

b) ……. – the number of minutes in $3\frac{1}{2}$ hours _____

c) ……. + $(1 \times 10^2) + (7 \times 10^1)$ _____

d) …… ÷ 6 – $\sqrt{169}$ _____

e) (……)^2 + 4^2 _____

EQUATION: a + b + c – d = e – d _____

Round 7:

a) Subtract South Africa's Gross Domestic Product from that of the richest country in Africa. (Resources 6) _____

b) ……. + the range of the GDP of African countries (Excluding islands) _____

c) ……. – the average GDP for the top 10 countries (round off to nearest whole number) _____

d) ……. ÷ the mode of this set of data _____

e) ……. – LXXVI _____

EQUATION: a + c + d = b + e _____

Round 8:

a) Using the scale of the map (Resources 1) calculate the direct distance between the capital city of Cameroon and the capital city of Malawi.(in Km) _____

b) ……. ÷ by the distance between Maseru and Mbabane _____

c) …… x number of minutes from 8am to 9:15am _____

d) …… – 2 gross _____

e) ……. – $(3^3 - 3^1)$ _____

EQUATION: a – b x c = d + e _____

Round 9:

a) Take the line of latitude that runs through Conakry (Guinea)and subtract it from the number of degrees in half a straight angle. _____

b) ……. + the line of longitude that passes through Tehran _____

c) ……. + the size of the 3rd angle if two angles of a Δ equal 150° _____

d) ……. + 10^2 _____

e) ……. ÷ 10 baker's dozen _____

EQUATION: c ÷ a = d ÷ b = e_____

Round 10:

a) If the Orange River flows in a southerly direction start with the number of degrees in a Δ If not start with the total number of degrees in 2 angles of an equilateral Δ. _____

b) ……. + the product of Roman Numerals VII and VIII _____

c) ……. – the supplementary angle of 154° _____

d) …… + the complementary angle of 30° _____

e) ……. $-(\frac{1}{2}$ of $4^3 + \sqrt{12\,996})$ _____

EQUATION: c + d = a + b + e _____

Round 11:

a) If the source of the Nile River is in the Mediterranean Sea start with the number of days in a fortnight. If its source is Lake Victoria, start with the total number of days in each of the months starting with a "J". _____

b) …… + the total number of degrees in a triangle and a quadrilateral _____

c) …… ÷ the H.C.F of 20 and 32 _____

d) …… + ☐ = 13^2 _____

e) …… + $\frac{1}{2}$ dozen + $\sqrt{38\,416}$ _____

EQUATION: b – a = 2 x c + d + e _____

Round 12:

a) Multiply the number of African countries bordering the Indian Ocean, by the number of land-locked countries within South Africa? _____

b) …… x the number of square metres in a hectare _____

c) …… ÷ (L x VIII) _____

d) …… + $\frac{3}{4}$ of 1 000 _____

e) …… ÷ $(6^2 + 2^2)$ _____

EQUATION: c x d x a = b x e _____

Round 13:

a) Multiply the number of **African** countries through which the Tropic of Cancer passes by the number of countries through which the Tropic of Capricorn passes._____

b) …… + the total number represented by the following prefixes

hexa + pent + nona + dodeca + icosa _____

c) Number of degrees in a revolution – …….. – 132° _____

d) …… – the 8th multiple of 13 _____

e) …… + number of minutes from 6:15 to 9:15 _____

EQUATION: d + a = c – b = e ÷ 3 _____

Round 14:

a) How many countries, situated entirely within the Southern hemisphere, are land-locked? (Reference: Resources 2) _____

b) …… + 12 x 4 + 3 score years and 10 _____

c) …… + 30^2 – the 6th multiple of 3 _____

d) …… – [(3 x 100) + (7 x 1)] _____

e) …… – number of centimetres in 3,94m _____

EQUATION: a x b = c = d + e _____

Round 15:

a) If the island of Réunion (East Coast) is governed by France, start with L.C.M of 6 and 4. If it is governed by Portugal, start with L.C.M of 6 and 5. (Ref. Resources 1)_____

b) …… + the number of days from April 16 to June 5 _____

c) …… – the number of minutes from 8:22 to 9:04 _____

d) …… x the 4th counting number _____

e) …… – the 16th prime number – the 5th natural number _____

EQUATION: (b – 2) ÷ a = d ÷ c + e _____

Round 16:

a) If Mogadishu (Somalia) is situated approximately 55°W of Monrovia (Liberia), start with the number of cm in 2,5m. If not, start with the number of cm in 3,25m. _____

b) …… = …… millimeters _____

c) …… ÷ DCL _____

d) …… days = ……. minutes _____

e) …… – 5 decades _____

EQUATION: b ÷ a x c = d – e _____

Round 17:

a) If it is 3pm in London (0°), what time is it in Harare (Zimbabwe)? _____

b) Convert …….. to minutes _____

c) Find the product of ……. and 2^3 _____

d) Find the quotient if …….is the dividend and 2 score is the divisor _____

e)Find the difference if ……. is the minuend and 6 + 2 x 17 is the subtrahend _____

EQUATION: b ÷ a = c ÷ d + e_____

Round 18:

a) If it is 12 noon in London (0°), what time is it in Nouakchott (Mauritania)? _____

b) …… x number of Ali Baba's thieves _____

c) …… – the boiling point of water, degrees Fahrenheit _____

d) …….. – the freezing point of water, degrees Fahrenheit _____

e) …….. – 13 Baker's dozen _____

EQUATION: a + b = d + c + e _____

Round 19:

a) If Western Sahara has more man-made borders than any other country in Africa, start with the 2nd prime number. If not, start with the 1st composite number. Now multiply your answer by the 9th number in a Fibonacci sequence starting at 1. _____

b) …… + the sum of all the Roman numerals $< \text{or} = 1\,000$ that are represented by only one letter _____

c) Find the difference between …… and 12^2 x $\sqrt{5 \text{ score} + 4 \text{ dozen} - 2^2}$ _____

d) Find the product of …… and the number of pints in a quart _____

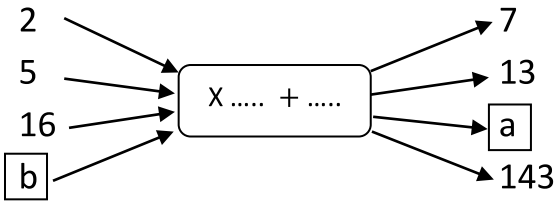
e) …… + 39^2 − LV _____

EQUATION: a + c + d = b − e _____

In this the final round there will be no equation at the end. So work carefully as you have no way of checking the accuracy of your calculations! Good luck!

Round 20:

a) Complete the flow diagram:



a = _____

b = _____

c) Now if your answer to (a) is represented by Ω and your answer (b) is represented by Ц , find the value of: [Ц]^2 ÷ Ω x [Ω + Ц] _____

d) …… + the number of seconds in a day _____

e) …… x the number of sides on a decagon −(10^4 + 10^3)

You are a WINNER!

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Answers

Round 1:

a) Passes through 6. Therefore start with 7th multiple of 6	42
b) 42 x 2	84
c) 84 + 6 + 10	100
d)100 ÷ 10	10
e) 10 + 6	16

EQUATION: a + b = c + d + e **42 + 84 = 100 + 10 + 16 = 126**

Round 2:

a) Yes, bordered by 6. Start with a score.	20
b) 20 + 180	200
c) 200 – 60	140
d) 140 x 3	420
e) 420 –360	60

EQUATION: a + b + c = d – e **20 + 200 + 140 = 420 – 60 = 360**

Round 3:

a) Djibouti; Niamey; Kinshasa; Bamako; Nouakchott; Gaborone	6
b) 6 x 7	42
c) 42 + 500	542
d) 542 – 360	182
e) 182 – 74	108

EQUATION: a x b + e = c - d **6 x 42 + 108 = 542 – 182 = 360**

Round 4:

a) Mali; Mauritania; Morocco; Malawi; Mozambique (5)
Capital of Burkina Faso is Ouagadougou (11) ∴ 5 x 11 55

b) 55 + 15 70

c) 70 + 16 86

d) 86 – 47 39

e) 39 x 6 + 22 256

EQUATION: c – b = a – d = $\sqrt{e}$ **86 – 70 = 55 – 39 = 16**

Round 5:

a) No. Start with $\frac{1}{2}$ of 250. 125

b) 125 + 500 625

c) (625 ÷ 25) – (2 x 10) = 25 – 20 5

d) 5 x 7 35

e) 35 – 28 7

EQUATION: b ÷ a = d ÷ e = c **625 ÷ 125 = 35 ÷ 7 = 5**

Round 6:

a) Yes. Start with 250 250

b) 250 – 210 40

c) 40 + 170 210

d) (210 ÷ 6) – $\sqrt{169}$ = 35 – 13 22

e) $(22)^2 + 4^2$ = 484 + 16 500

EQUATION: a + b + c – d = e – d **250 + 40 + 210 – 22 = 500 – 22 = 478**

Round 7:

a) 1092 — 724 =	368
b) 368 + (1 092 – 2 = 1090)(Exclude last 3. They are islands) 368 + 1090	1 458
c) 1 458 — (4439 ÷ 10 = 443,9) = 1 458 — 444	1 014
d)1 014 ÷ 3 appears most times	338
e) 338 — 76	262

EQUATION: a + c + d = b + e	**368 + 1 014 + 338 = 1 458 + 262 = 1 720**

Round 8:

a) 6cm : 3 000km	3 000
b) 3 000 ÷ 500	6
c) 6 x 75	450
d) 450 —288	162
e) 162 – (27 — 3) = 162 – 24	138

EQUATION: a – b x c = d + e	**3 000 – 6 x 450 = 162 + 138 = 300**

Round 9:

a)10° - 90°	80
b) 80 + 50°	130
c) 130 + 30	160
d) 160 + 100	260
e) 260 ÷ 130	2

EQUATION: c ÷ a = d ÷ b = e	**160 ÷ 80 = 260 ÷ 130 = 2**

Round 10:

a) 60 x 2	120
b) 120 + 56	176
c) 176 – (180 - 154°)	150
d) 150 + 60°	210
e) 210 $-(\frac{1}{2}$ of 64 + 114)	64

EQUATION: c + d = a + b + e	**150 + 210 = 120 + 176 + 64 = 360**

Round 11:

a)January 31 + June 30 + July 31	92
b) 92 + 180 + 360	632
c) 632 ÷ 4	158
d) 158 + **11** = 169	11
e) 11 + 6 + 196	213

EQUATION: b – a = 2 x c + d + e	**632 – 92 = 2 x 158 + 11 + 213 = 540**

Round 12:

a) 5 x 2	10
b) 10 x 10 000	100 000
c) 100 000 ÷ (50 x 8)	250
d) 250 + 750	1 000
e) 1 000 ÷ (36 + 4)	25

EQUATION: c x d x a = b x e	**250 x 1 000 x 10 = 100 000 x 25 = 2500 000**

Round 13:

a) 6 x 4	24
b) 24 + 6 + 5 + 9 + 12 +20	76
c) 360 – **76** – 132°	152
d) 152 – 104	48
e) 48 + 180	228

EQUATION: d + a = c – b = e ÷ 3 **48 + 28 = 152 – 76 = 228 ÷ 3 = 76**

Round 14:

a) Zambia, Zimbabwe, Botswana, Swaziland, Lesotho, Rwanda, Burundi, Malawi 8

b) 8 + (12 x 4) + (3 score years and 10)	126
c) 126 + 900 – 18	1 008
d) 1 008 – 307	701
e) 701 – 394	307

EQUATION: a x b = c = d + e **8 x 126 = 1 008 = 701 + 307 = 1 008**

Round 15:

a) Yes. Start with 12	12
b) 12 + 14 + 31 + 5	62
c) 62 – 42	20
d) 20 x 3	60
e) 60 – 53 – 5	2

EQUATION: (b – 2) ÷ a = d ÷ c + e **(62 – 2) ÷ 12 = 60 ÷ 20 + 2 = 5**

Round 16:

a) Lies east. Start with cm in 3,25m.	325
b) 325cm = 3 250 millimeters	3 250
c) 3 250 ÷ 650	5
d) 5 days = 7 200 minutes	7 200
e) 7 200 – 50	7 150

EQUATION: b ÷ a x c = d – e	**3 250 ÷ 325 x 5 = 7 200 – 7150 = 50**

Round 17:

a) Lies 30° east therefore add 2 hours.	5pm
b) 5 hours = 300 minutes	300
c) 300 x 8	2 400
d) 2 400 ÷ 40	60
e) 60 – 40	20

EQUATION: b ÷ a = c ÷ d + e	**300 ÷ 5 = 2 400 ÷ 60 + 20 = 60**

Round 18:

a) Lies 15° west, therefore subtract 1 hour	11am
b) 11 x 40	440
c) 440 – 212	228
d) 228 – 32	196
e) 196 – 169	27

EQUATION: a + b = d + c + e	**11 + 440 = 196 + 228 + 27 = 451**

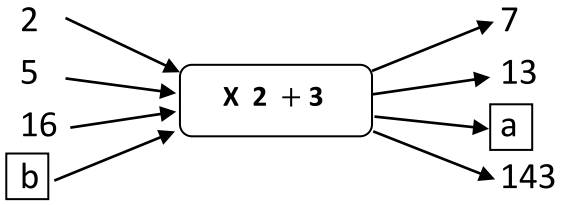
Round 19:

a) Yes. Start with 3 x 34 (1; 1; 2; 3; 5; 8; 13; 21; **34**)	102
b) 102 + (1 + 5 + 10 + 50 + 100 + 500 + 1 000) 1 666	1 768
c) 1 768 — 144 x 12	40
d) 40 X 2	80
e) 80 + 1 521 — 55	1546

EQUATION: a + c + d = b — e	**102 + 40 + 80 = 1 768 – 1 546 = 222**

Round 20:

a)



a = 35

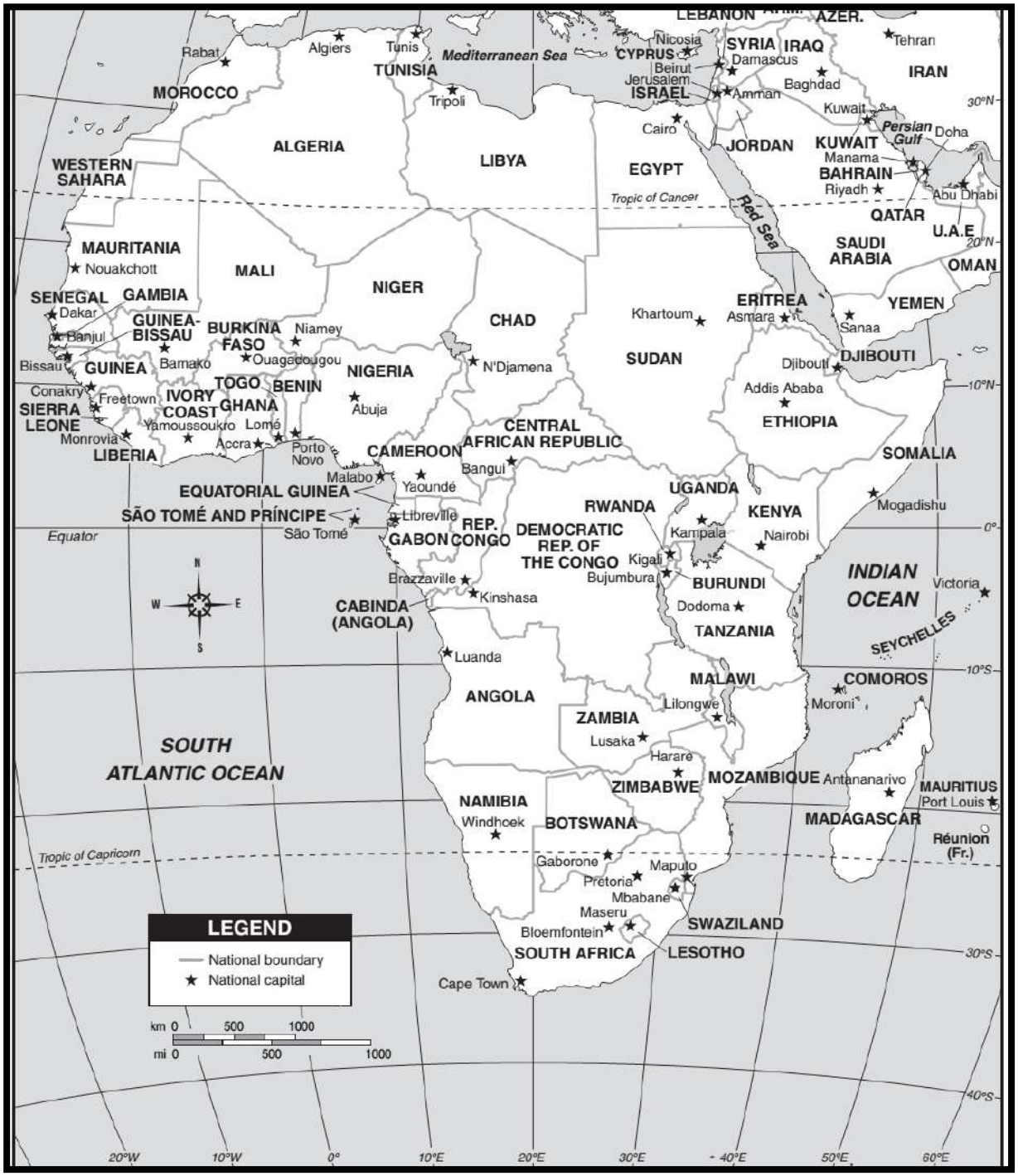
b = 70

c) [Ψ]^2 ÷ Ω x [Ω + Ψ] = 70^2 ÷ 35 X (35 + 70)	14 700
d) 14 700 + 86 400	101 100
e) 101 100 x 10 — 11 000	**1 000 000**

You are a WINNER!

Resources 1:

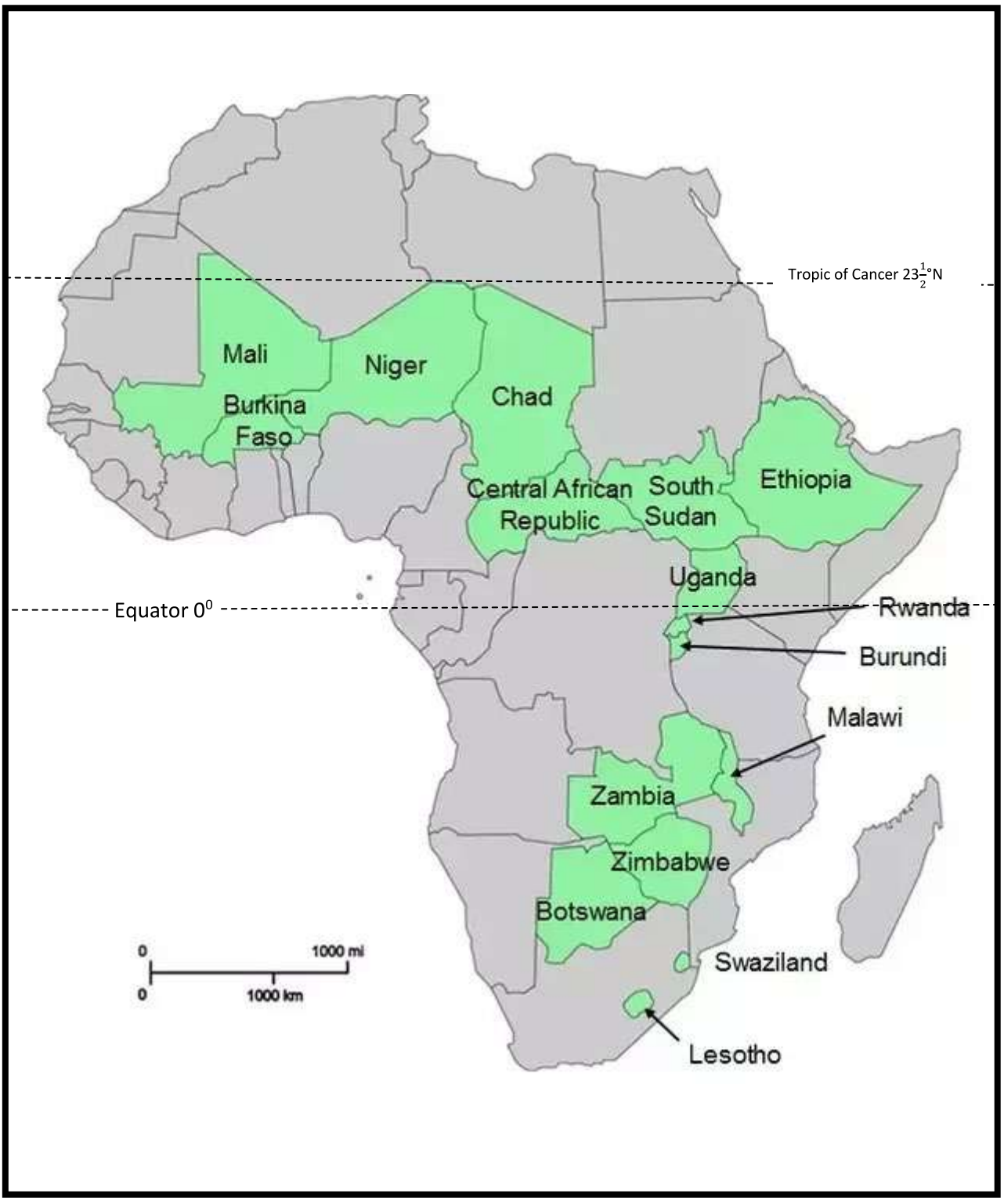
Political Map of Africa



Scale: 1cm = 500km

Resources 2:

Land-locked countries in Africa



Resources 3:

Capital Cities of African Nations

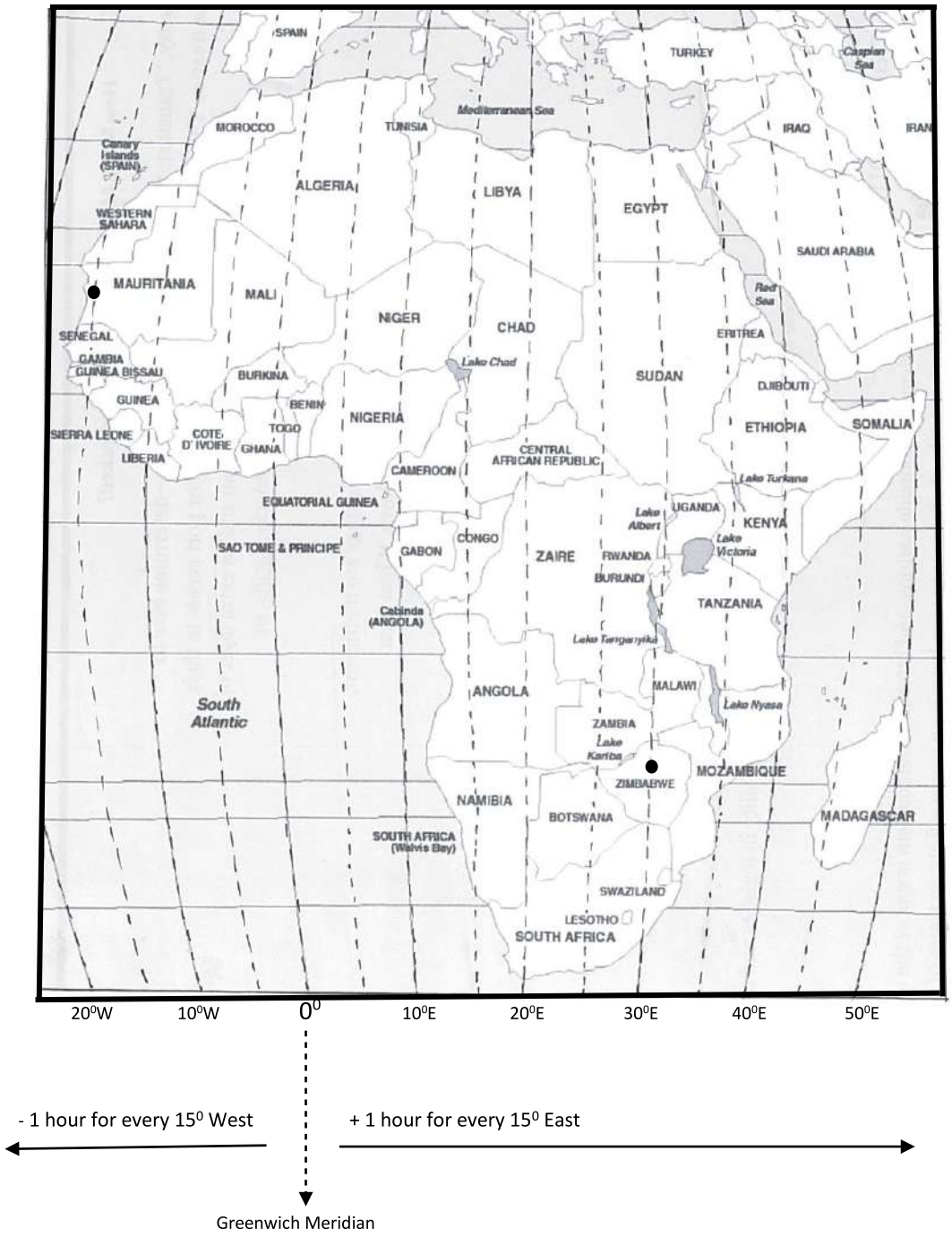
Capital City	Country
Abuja	Nigeria
Accra	Ghana
Addis Ababa	Ethiopia
Algiers	Algeria
Antananarivo	Madagascar
Asmara	Eritrea
Bamako	Mali
Bangui	Central Africa
Banjul	Gambia
Bissau	Guinea-Bissau
Brazzaville	Congo
Bujumbura	Burundi
Cairo	Egypt
Cape Town (legislative) Bloemfontein (judicial) Pretoria (administrative)	South Africa
Conakry	Guinea
Dakar	Senegal
Dar es Salaam	Tanzania
Djibouti	Djibouti
Freetown	Sierra Leone
Gaborone	Botswana
Harare	Zimbabwe
Juba	South Sudan
Kampala	Uganda
Khartoum	Sudan
Kigali	Rwanda
Kinshasa	D.R.Congo
El Aaiún	Western Sahara

Capital City	Country
Libreville	Gabon
Lilongwe	Malawi
Mbabane **(admin)** Lobamba **(legislative)**	Swaziland
Lomé	Togo
Luanda	Angola
Lusaka	Zambia
Malabo	Equatorial Guinea
Maputo	Mozambique
Maseru	Lesotho
Mogidishu	Somalia
Monrovia	Liberia
Moroni	Comoros
Nairobi	Kenya
N'Djamena	Chad
Niamey	Niger
Nouakchott	Mauritania
Ouagadougou	Burkina Faso
Port Louis	Mauritius
Porto-Nova(const.) Cotonou (seat of gvt)	Benin
Praia	Cape Verde
Rabat	Morocco
Tripoli	Libya
Tunis	Tunisia
Victoria	Seychelles
Windhoek	Namibia

Resources 4:

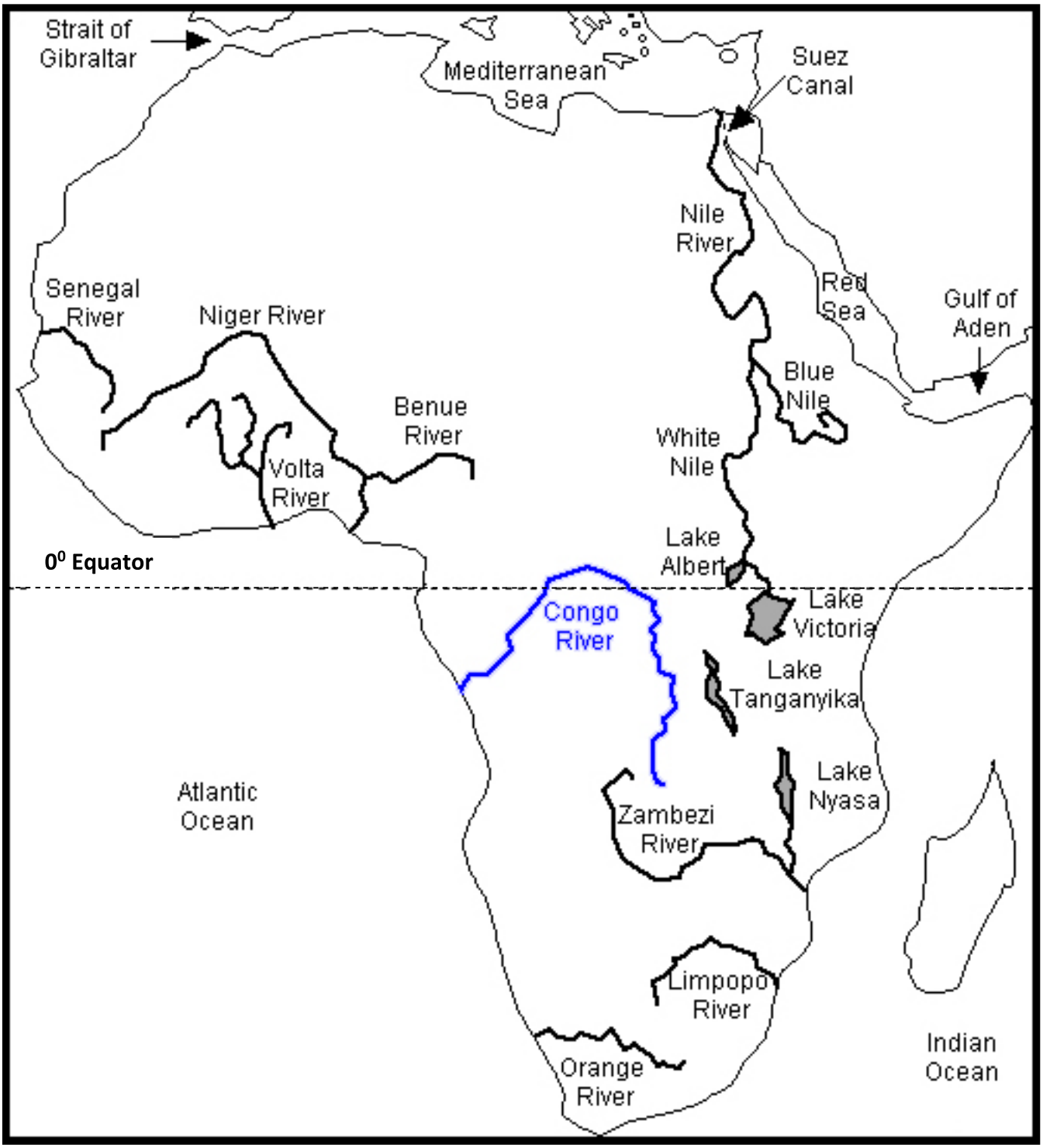
Time Zones

Using lines of longitude, the world is divided into 24 time zones, each 15^0 apart. Time is calculated from 0^0 longitude, also known as the Greenwich Meridian. For every 15^0 west of 0^0, subtract one hour, and for every 15^0 east add one hour.



Resources 5:

Rivers of Africa



Resources 6:

List of African Countries by Gross Domestic Product 2015

The GDP indicator is the total value of all goods and services produced by a country in one year. The higher the GDP, the wealthier the country. The GDP is recorded in millions of International Dollars.

Rank	Country	GDP	Rank	Country	GDP
1	Nigeria	1 092	27	Zimbabwe	28
2	Egypt	996	28	Equa. Guinea	26
3	South Africa	724	29	Namibia	25
4	Algeria	571	30	Mauritius	25
5	Morocco	275	31	Benin	21
6	Angola	185	32	Malawi	21
7	Sudan	167	33	Rwanda	20
8	Ethiopia	159	34	Niger	19
9	Kenya	143	35	Mauritania	16
10	Tunisia	127	36	Guinea	15
11	Ghana	113	37	Swaziland	11
12	Libya	93	38	Togo	11
13	Uganda	80	39	Eritrea	8
14	Ivory Coast	78	40	Burundi	8
15	Cameroon	72	41	Somalia	6
16	Zambia	65	42	Lesotho	6
17	D.R of Congo	63	43	Liberia	4
18	Botswana	37	44	Gambia	3
19	Senegal	36	45	Cape Verdi	3
20	Madagascar	36	46	Djibouti	3
21	Gabon	34	47	Seychelles	3
22	Mozambique	34	48	Guinea-Bissau	2
23	Chad	32	49	Central A.R	2
24	Burkina Faso	31	50	Comoros	1
25	Mali	29	51	Sao Tome	1
26	Rep. Congo	29	52	Principe	1

DAWSAN'S *Maths* DICTIONARY

S. Edwards & D. Williams