SECTION 1A: INTEGER ADDITIONS

All answers are required to their full accuracy

1)	28	+	73									=	_____	1
2)	88	+	79									=	_____	1
3)	211	+	774									=	_____	1
4)	197	+	765	+	456							=	_____	2
5)	71159	+	44872									=	_____	2
6)	3613	+	7780	+	7666	+	3805					=	_____	3
7)	1409556	+	5708110									=	_____	3
8)	312696	+	157988	+	39406							=	_____	3
9)	5677472	+	6061440	+	4261931							=	_____	4
10)	1393541	+	7949113	+	2929768	+	9588175					=	_____	5
11)	3586660	+	3118984	+	8708382	+	6487108	+	8139930			=	_____	6
12)	15448525	+	10079131	+	8841416	+	23723332	+	12390451			=	_____	7
13)	993989099	+	535271927	+	496688279	+	869260289	+	249755313	+	163453114	=	_____	9

Total value: 47

SECTION 1B: INTEGER SUBTRACTIONS

All answers are required to their full accuracy

1)	71	-	10	=	_____	1
2)	97	-	6	=	_____	1
3)	109	-	22	=	_____	1
4)	2658	-	1289	=	_____	1
5)	66500	-	22761	=	_____	1
6)	29073	-	1736	=	_____	1
7)	787689	-	426548	=	_____	2
8)	509760	-	256320	=	_____	2
9)	5329312	-	811245	=	_____	2
10)	6509742	-	501794	=	_____	2
11)	22654155	-	4974887	=	_____	2
12)	993159751	-	243620191	=	_____	3
13)	3383770412	-	1424443684	=	_____	3
14)	41175187976	-	1923462994	=	_____	4
15)	418385157201	-	212318554321	=	_____	4
16)	1986212852925	-	1059543012670	=	_____	5
17)	568638515612928	-	406919243254703	=	_____	6
18)	456648535251072	-	316438679442454	=	_____	6

Total value: 47

SECTION 1C: DECIMAL ADDITIONS & SUBTRACTIONS

All answers are required to their full accuracy

1)	3.7	+	6.1									=	_____	1
2)	3.6	+	1.1	+	8.5							=	_____	1
3)	1.2	+	6.2	+	4.4	+	9.4					=	_____	2
4)	9362.5	+	602.62									=	_____	2
5)	339.3	+	536.8	+	913.4	+	968.2	+	886.3			=	_____	3
6)	831347.12	+	56891.403									=	_____	4
7)	801.68	+	8575.5	+	851.61	+	555.82	+	1971.4	+	276.61	=	_____	5
8)	106.547	+	765.866	+	96017.2	+	7914.64	+	21874.9	+	810.863	=	_____	5
9)	39477.5633	+	41924.42249	+	76910.9055	+	60708.73717					=	_____	6
10)	6.6	-	5.1									=	_____	1
11)	69.4	-	50.3									=	_____	1
12)	738.7	-	265									=	_____	1
13)	1609.6	-	942									=	_____	1
14)	4399.01	-	2490.79									=	_____	2
15)	51056.23	-	14761.28									=	_____	2
16)	62828.691	-	23606.474									=	_____	3
17)	622417.157	-	131581.347									=	_____	3
18)	3461280.096	-	2672905.104									=	_____	4

Total value: 47

SECTION 1D: MIXED ADDITIONS & SUBTRACTIONS

All answers are required to their full accuracy

1)	514	-	343	+	261						=	_____	2
2)	8310	-	5032	+	7224						=	_____	2
3)	7814	-	4560	+	5431	-	5257				=	_____	3
4)	6100	-	2120	+	5166	-	3987				=	_____	3
5)	6233	-	2041	+	3224	-	2787				=	_____	3
6)	5323	-	3130	+	4394	-	2133				=	_____	3
7)	9798	-	5824	+	6195	-	5414				=	_____	3
8)	5729	-	3770	+	3820	-	3195				=	_____	3
9)	96023	-	56408	+	58507	-	40460				=	_____	3
10)	33437	-	13940	+	29595	-	15104				=	_____	4
11)	345787	-	223794	+	227178	-	196624				=	_____	5
12)	313194	-	185078	+	256738	-	205827	+	582372		=	_____	6
13)	546368	-	308358	+	273905	-	185713	+	599207		=	_____	6
14)	437685	-	184177	+	319420	-	291980	+	960595		=	_____	6
15)	4030063	-	2414333	+	3704656	-	1264988	+	1667428		=	_____	7

Total value: 59

SECTION 2: INTEGER MULTIPLICATIONS

All answers are required to their full accuracy

1)	7	x	28			=	_____		1
2)	4	x	79			=	_____		1
3)	70	x	51			=	_____		2
4)	29	x	716			=	_____		4
5)	44	x	3939			=	_____		5
6)	943	x	7941			=	_____		6
7)	44	x	71641			=	_____		6
8)	3937	x	7799			=	_____		8
9)	409	x	880105			=	_____		10
10)	20119	x	95759			=	_____		13
11)	3074	x	4834133			=	_____		16
12)	197821	x	6729744			=	_____		20
13)	8444448	x	75406747			=	_____		25
14)	9	x	6	x	7	=	_____		1
15)	8	x	28	x	16	=	_____		3
16)	98	x	67	x	28	=	_____		6
17)	71	x	128	x	286	=	_____		12
18)	327	x	376	x	9919	=	_____		18
19)	575	x	233	x	3670	=	_____		18
20)	535	x	7536	x	5765	=	_____		25

Total value: 200

SECTION 3: INTEGER DIVISIONS (EXACT)

All answers in this section are required to their full accuracy.

1)	70	/	5	=	_____	1
2)	600	/	30	=	_____	1
3)	8500	/	85	=	_____	2
4)	91020	/	6068	=	_____	3
5)	795984	/	7107	=	_____	4
6)	5180598	/	81	=	_____	4
7)	161928	/	53976	=	_____	5
8)	79293305	/	7577	=	_____	6
9)	4084213868	/	92	=	_____	7
10)	565131600	/	843480	=	_____	8
11)	8202972036	/	403948	=	_____	9
12)	91890422386	/	350726803	=	_____	11

For Q13-22, find the missing number.
Each answer is an exact integer.

13)	17 x 14 x ? = 21658	? =	_____	6
14)	89 x 24 x ? = 1593456	? =	_____	8
15)	47 x 159 x ? = 1599222	? =	_____	10
16)	451 x 408 x ? = 66794904	? =	_____	12
17)	703 x 473 x ? = 3184201944	? =	_____	19
18)	77 x 60 x 11 x ? = 1626240	? =	_____	9
19)	46 x 43 x 245 x ? = 254420250	? =	_____	15
20)	287 x 340 x 562 x ? = 53688320840	? =	_____	18
21)	70 x 28 x 52 x 25 x ? = 196196000	? =	_____	14
22)	81 x 58 x 971 x 865 x ? = 3657868461090	? =	_____	28

Total value: 200

SECTION 4: APPROXIMATE MULTIPLICATIONS

For Q1-6, give the answer to the nearest integer.

1)	1.1	x	1.5			=	_____	3
2)	5.9	x	7.5			=	_____	4
3)	9.3	x	57.6			=	_____	7
4)	64.5	x	82.3			=	_____	8
5)	27.2	x	8965.8			=	_____	12
6)	509.5	x	9776889.1			=	_____	23

For Q7-9, give the answer to four significant figures.

7)	1.3	x	1231.6			=	_____	9
8)	98.1	x	1626.1			=	_____	12
9)	12.9	x	83.05	x	844.4	=	_____	38

For Q10-12, give the answer to five significant figures.

10)	92.96	x	887.36			=	_____	14
11)	39.11	x	30761.7			=	_____	19
12)	492.9	x	37.71	x	248.3	=	_____	51

Total value: 200

SECTION 5: APPROXIMATE DIVISIONS

For Q1-8, give the answer to the nearest integer.

For example, 13 / 3 = 4 or 85 / 8 = 11

1)	14	/	4	=	_____	2
2)	410	/	6	=	_____	3
3)	9676	/	27	=	_____	4
4)	2532	/	635	=	_____	5
5)	924440	/	47	=	_____	6
6)	1664085	/	86533	=	_____	9
7)	94533887579	/	10908	=	_____	13
8)	382888859368	/	6222627031	=	_____	16

For Q9-12, give the answer to four significant figures.

9)	3507.1575	/	64.2	=	_____	10
10)	187520.425	/	21.46	=	_____	12
11)	4752115.53	/	7226.1	=	_____	12
12)	432221.9189	/	6218.4	=	_____	13

For Q13-15, give the answer to six significant figures.

13)	3615105.0379	/	791.7	=	_____	30
14)	567765.20858	/	807.94	=	_____	30
15)	5450078.94701	/	6436.17	=	_____	35

Total value: 200

SECTION 6: PRIME FACTORS

Specify each number as the product of prime factors. Factors must be recorded the relevant number of times, although the order does not matter.

For example, 84: 2, 2, 3, 7 and 7, 2, 3, 2 are both correct, but 2, 3, 7 is not.

No prime factor greater than 13 is used in this section

1)	66	_____	1
2)	700	_____	2
3)	8712	_____	3
4)	52728	_____	5

No prime factor greater than 19 is used in this section

5)	8085	_____	6
6)	72618	_____	8
7)	750750	_____	11
8)	5140443	_____	15

No prime factor greater than 41 is used in this section

9)	74865	_____	11
10)	309225	_____	16
11)	4370938	_____	22
12)	85840209	_____	30

For Q13-14, each is the product of 4 (not necessarily different) 2-digit primes.

13)	1827971	_____	35
14)	3039107	_____	35

Total value: 200

SECTION 7A: FRACTION ADDITIONS

1)	4	2 ### 3	+	3	1	/	3			0	1	=	_____	2
2)	7	2 ### 7	+	11	5	/	6			0	1	=	_____	3
3)	24	1 ### 2	+	12	4	/	5			0	1	=	_____	4
4)	13	3 ### 13	+	36	21	/	22			0	1	=	_____	6
5)	16	4 ### 21	+	21	25	/	32	+	23	4	/ 9	=	_____	10
6)	29	25 ### 34	+	25	50	/	81	+	33	6	/ 19	=	_____	24
7)	89	57 ### 116	+	56	39	/	119	+	73	13	/ 48	=	_____	38

Total value: 87

SECTION 7B: FRACTION SUBTRACTIONS

1)	2	5	/	9	-	1	2	/	5	=	_____	2
2)	19	19	/	37	-	18	24	/	43	=	_____	4
3)	36	1	/	3	-	22	11	/	34	=	_____	5
4)	90	36	/	65	-	59	49	/	89	=	_____	6
5)	418	83	/	192	-	397	13	/	30	=	_____	11

Total value: 28

SECTION 7C: FRACTION ADDITIONS & SUBTRACTIONS MIXED

1)	5	3	/	4	-	3	7	/	8	+	5	5 / 7	=	_____	4
2)	18	7	/	8	-	17	14	/	15	+	9	5 / 7	=	_____	7
3)	15	1	/	2	-	10	1	/	4	+	18	3 / 4	=	_____	11
4)	35	26	/	37	-	29	2	/	3	+	22	2 / 9	=	_____	18
5)	29	7	/	8	-	22	1	/	2	+	19	7 / 11	=	_____	18
6)	27	29	/	30	-	27	45	/	89	+	29	19 / 45	=	_____	27

Total value: 85

SECTION 8A: FRACTION MULTIPLICATIONS

1)	3	1	/	5	x	1	1	/	2				=	_____	2
2)	12	1	/	3	x	8	2	/	11				=	_____	5
3)	85	13	/	53	x	70	1	/	7				=	_____	25
4)	137	31	/	41	x	137	10	/	33				=	_____	48
5)	2	5	/	6	x	3	5	/	6	x	2	3 / 10	=	_____	7
6)	12	5	/	11	x	5	6	/	13	x	5	1 / 3	=	_____	17
7)	11	5	/	6	x	22	3	/	8	x	7	5 / 19	=	_____	40

Total value: 144

SECTION 8B: FRACTION DIVISIONS

1)	7	7	/	9	/	2	1	/	2	=	3
2)	48	21	/	23	/	6	15	/	23	=	9
3)	135	67	/	135	/	10	19	/	25	=	13
4)	464	161	/	335	/	20	37	/	67	=	31

Total value: 56

SECTION 9A: CALENDAR CALCULATIONS

For Q1-3, enter the correct weekday (eg. *Saturday* or *Sat*).

1) June 8, 1904 _____ 2

2) October 10, 1935 _____ 2

3) July 15, 2037 _____ 2

For Q4-6, enter the correct date in the specified month.

4) Fifth Wednesday in August 2012 = Day No. _____ 3

5) Fourth Saturday in July 1945 = Day No. _____ 3

6) First Friday in July 2080 = Day No. _____ 3

For Q7-9, insert any month for which the equation is correct (eg. *October* or *Oct*). The solution is not necessarily unique; however only one answer is required in each case.

7) Day 26 of the month in 2082 = Monday _____ 6

8) Day 16 of the month in 1920 = Thursday _____ 6

9) Day 4 of the month in 2064 = Tuesday _____ 6

For Q10-12, insert the largest year less than or equal to 1968 (inclusive) for which the equation is correct. For example, if the equation works with years 1963 and 1967, then only 1967 is the correct answer.

10) October 14 = Thursday _____ 12

11) September 25 = Monday _____ 12

12) March 6 = Friday _____ 12

Total value: 69

SECTION 9B: TIME CALCULATIONS

For Q1-5, give the time in seconds between the given dates and times.
The start & finish dates are the same unless otherwise stated.

1)	From	8:29:13	on	May 11, 1976	to	23:06:59	on	May 11, 1976	_____	6
2)	From	0:58:41	on	February 7, 1954	to	14:11:56	on	February 12, 1954	_____	10
3)	From	10:07:21	on	June 11, 1988	to	15:26:05	on	July 26, 1988	_____	16
4)	From	15:54:16	on	April 16, 1975	to	11:46:34	on	March 14, 1976	_____	28
5)	From	16:08:59	on	April 16, 2032	to	16:20:22	on	September 5, 2037	_____	36

For Q6-10, convert the given period of time into the required scale, correct to 4 significant figures.

6)	155100 minutes in hours	_____	7
7)	22930 minutes in seconds	_____	7
8)	819.2 hours in seconds	_____	7
9)	88.28 days in minutes	_____	7
10)	23450 minutes in hours	_____	7

Total value: 131

SECTION 10: MISCELLANEOUS (ALGEBRAIC, NEXT SQUARES/CUBES, REMAINDERS)

For Q1-3, give x to 4 significant figures.

1)	1/6 - 1/21 = 1/ x	x =	_____	4
2)	1/23 - 1/37 = 1/ x	x =	_____	8
3)	1/69 - 1/117 = 1/ x	x =	_____	15

For Q4-8, give the next exact square after the given number.
For example, the next exact square after 222 is 225 (which is 15_2); only the number is required, ie "225".

4)	What is the next exact square after	800 ?	_____	1
5)	What is the next exact square after	99187 ?	_____	7
6)	What is the next exact square after	596399 ?	_____	11
7)	What is the next exact square after	1767787 ?	_____	17
8)	What is the next exact square after	784505499 ?	_____	25

For Q9-12, give the next exact cube after the given number.

For example, the next exact cube after 222 is 343 (which is 7_3); only the number is required, ie "343".

9)	What is the next exact cube after	355 ?	_____	1
10)	What is the next exact cube after	170994 ?	_____	12
11)	What is the next exact cube after	6754763 ?	_____	18
12)	What is the next exact cube after	890969936 ?	_____	37

For Q13-18, give the remainder after dividing the two integer values.

For example, the remainder of 553 / 6 is 1 (because 553 = {92 x 6} + 1).

13)	86	/	9	Remainder =	_____	1
14)	591	/	16	Remainder =	_____	2
15)	5174	/	64	Remainder =	_____	4
16)	67155	/	46	Remainder =	_____	8
17)	680758	/	592	Remainder =	_____	12
18)	33829811	/	53	Remainder =	_____	17

Total value: 200

SECTION 11A: EXACT ROOTS

All the answers in this section are integers.

1)	Square root of	676	=	_____	1
2)	Square root of	3600	=	_____	1
3)	Square root of	45369	=	_____	2
4)	Square root of	9265936	=	_____	3
5)	Square root of	54730404	=	_____	3
6)	Square root of	7491075601	=	_____	5
7)	Cube root of	5832	=	_____	1
8)	Cube root of	778688	=	_____	2
9)	Cube root of	1520875	=	_____	3
10)	Cube root of	521660125	=	_____	4
11)	Cube root of	34075248488	=	_____	6
12)	5 th root of	59049	=	_____	2
13)	7 th root of	4902227890625	=	_____	10
14)	5 th root of	1889568	=	_____	3
15)	7 th root of	2097152	=	_____	5
16)	4 th root of	58573800926022001	=	_____	8
17)	6 th root of	172358602780396096	=	_____	9
18)	7 th root of	536143015838069981	=	_____	7

Total value: 75

SECTION 11B: INEXACT ROOTS

For Q1-10, give the answer to the nearest integer.

For example, square root of 28 = 5 or cube root of 47 = 4.

1)		Square root of	26	=	_____	1
2)		Square root of	113	=	_____	1
3)		Square root of	21726	=	_____	3
4)		Cube root of	364	=	_____	1
5)		Cube root of	7212	=	_____	2
6)		Cube root of	511	=	_____	2
7)	5 th	root of	46569	=	_____	4
8)	4 th	root of	37007967	=	_____	6
9)	7 th	root of	724157	=	_____	8
10)	7 th	root of	13896291	=	_____	5

For Q11-16, give the answer to 3 significant figures.

11)		Square root of	638	=	_____	3
12)		Cube root of	5115	=	_____	6
13)	4 th	root of	933492	=	_____	9
14)	6 th	root of	1609	=	_____	9
15)	5 th	root of	68792	=	_____	9
16)	4 th	root of	149880	=	_____	9

For Q17-20, give the answer to 2 decimal places.

17)	4 th	root of	4857	=	_____	8
18)	6 th	root of	5296	=	_____	10
19)	7 th	root of	5963	=	_____	13
20)	6 th	root of	528753	=	_____	16

Total value: 125

SECTION 12: BASE CONVERSIONS

In each of the first 15 problems, your task is to convert a number from one base to another. No base higher than 16 will be used in any of these problems. For bases higher than 10, the character 'A' represents a unit count of 10, 'B' a count of 11, 'C' represents 12, 'D' represents 13, 'E' shows 14, and 'F' shows a value of 15.

1)	Convert	440	from base	5	into base	6	_____	2
2)	Convert	A2A	from base	11	into base	5	_____	6
3)	Convert	8458	from base	10	into base	15	_____	17
4)	Convert	6385	from base	11	into base	14	_____	8
5)	Convert	21323554	from base	7	into base	13	_____	12
6)	Convert	2DC4	from base	14	into base	10	_____	17

Add the following numbers in their given bases, giving the answer in base 10 in each case.

7)	A	(base 15)	+	33	(base 16)	=	(in base 10)	_____	5
8)	782	(base 11)	+	43	(base 14)	=	(in base 10)	_____	13
9)	83	(base 11)	+	4CA	(base 14)	=	(in base 10)	_____	14
10)	B223	(base 12)	+	AC6	(base 16)	=	(in base 10)	_____	21

Multiply the following numbers in their given bases, giving the answer in base 10 in each case.

11)	342	(base 9)	x	4203113	(base 5)	=	(in base 10)	_____	22
12)	75	(base 13)	x	76	(base 15)	=	(in base 10)	_____	30
13)	6A8	(base 12)	x	506065	(base 7)	=	(in base 10)	_____	33

Total value: 200

SECTION 13: SUMS OF SQUARES

Each of the following is the sum of 2, 3 or 4 exact squares.
There may be more than one answer; only one is required in each case.
Zeros may not be used, and at least two numbers must be given.
Please give the numbers to be squared, not the actual squares.

Example: 144 = 6^2 + 6^2 + 6^2 + 6^2, and so the answer '6, 6, 6, 6' is correct.
The answers '36+36+36+36', '12^2' and '12^2+0^2' will not be accepted.

1)	900	_____	2
2)	664	_____	2
3)	745	_____	2
4)	767	_____	2
5)	753	_____	2
6)	759	_____	2
7)	3885	_____	4
8)	4974	_____	4
9)	8983	_____	4
10)	3748	_____	4
11)	9546	_____	4
12)	62550	_____	7
13)	58559	_____	7
14)	60137	_____	7
15)	92773	_____	7
16)	170970	_____	14
17)	146031	_____	14
18)	712902	_____	14
19)	779706	_____	14
20)	8411101	_____	28
21)	5452611	_____	28
22)	4435757	_____	28

Total value: 200

SECTION 14: BRACKETS

1)	(51 + 44) x (49 + 46)	=	_____	3
2)	(53 + 56) x (61 + 45)	=	_____	3
3)	((578 - 8) /38) x (137 + 738)	=	_____	4
4)	((727 - 7) /16) x (328 + 168)	=	_____	4
5)	((858 - 3) /57) x (655 + 232)	=	_____	4
6)	((877 - 77) /16) x (7465 + 711)	=	_____	5
7)	((896 - 64) /16) x (6276 + 437)	=	_____	5
8)	(69 + (4 x 89)) x (650 - 98)	=	_____	7
9)	(74 + (9 x 57)) x (912 - 95)	=	_____	7
10)	(99 + (2 x 97)) x (641 - 76)	=	_____	7
11)	((5192 - 44) /26) x (2885 + 1129)	=	_____	11
12)	((4822 - 70) /24) x (2317 + 3658)	=	_____	11
13)	(84 + (42 x 87)) x (9441 - 81)	=	_____	16
14)	(52 + (50 x 56)) x (9921 - 64)	=	_____	16
15)	((3 1/8 + 4 2/7) x 7 1/2)	=	_____	8
16)	(3 1/4 + 6 3/5) x (4 1/3 + 7 3/8)	=	_____	12
17)	(4 1/3 + 7 2/5) x (5 1/6 + 7 2/7)	=	_____	15
18)	(7 1/3 + 3 1/6 + 7 1/6) x (3 3/5 + 3 3/8)	=	_____	25
19)	(6 1/5 + 4 3/5 + 6 1/7) x (3 3/10 + 5 1/3 + 4 1/4)	=	_____	37

Total value: 200

SECTION 15: VALUE COMPARISONS

Place the following numbers in order of increasing value

1)	12/17, 0.555, 46/73, 16/21, 12/25	=	6
2)	24/37, 45/64, 15/32, 0.590, 41/78	=	6
3)	14/27, 17/29, 46/59, 0.685, 17/38, 0.831	=	8
4)	0.366, 9/16, 20/43, 0.631, 53/68, 5/7	=	8
5)	31/45, 31/40, 21/34, 76/87, 13/25	=	9
6)	32/57, 17/28. 5/11, 26/35, 7/10	=	9
7)	38/83, 10/13, 0.504, 47/70, 10/17, 64/77	=	10
8)	46/89, 68/95, 41/70, 11/26, 11/17, 0.773	=	10
9)	47/83, 8/19, 27/41, 18/25, 23/29, 12/25	=	12
10)	20/29, 8/21, 57/97, 71/92, 37/76, 9/14	=	12
11)	26/33, 15/44, 19/30, 4/7, 26/37, 13/32, 46/97	=	15
12)	29/49, 12/23, 27/58, 2/3, 14/37, 31/41, 5/18	=	15
13)	19/29, 55/68, 11/15, 6/17, 37/65, 43/90, 15/49, 3/7	=	18
14)	9/13, 4/9, 3/5, 10/13, 47/93, 11/28, 20/31, 2/7	=	18
15)	19/31, 31/56, 64/91, 20/63, 7/29, 58/73, 7/15, 19/48, 49/57	=	22
16)	15/43, 6/25, 16/27, 31/69, 11/39, 22/31, 28/43, 13/24, 24/31	=	22

Total value: 200

SECTION 16: MISCELLANEOUS QUESTIONS, PART 2

Q 1-4: Simultaneous equations.

Each answer consists of exact integer values which may be listed in any order.

1)	A + B = 13, A^2 + B^2 = 85	A =, B=	_____	2
2)	A + B = 46, A^2 + B^2 = 1130	A =, B=	_____	4
3)	A + B = 60, A^2 + B^2 = 2138	A =, B=	_____	8
4)	A + B + C = 40, A^2 + B^2 + C^2 = 664	A =, B=, C=	_____	28

Q 5-8: Powers of fractions.

Give the result of each equation to the nearest integer.

5)	1 1/3 ^ 3	=	_____	1
6)	2 3/4 ^ 3	=	_____	4
7)	3 5/6 ^ 4	=	_____	10
8)	4 8/9 ^ 4	=	_____	17

Q 9-12: Geometry.

Volume of a cone: 1/3 pi r^2 h Take the value of pi as 3.1416
Volume of a sphere: 4/3 pi r^3
Right-angled triangle: A^2 + B^2 = C^2
Volume of a pyramid: 1/3 base (lw) h

Give the answer to each of the following (Q9-11) to the nearest integer.

9)	Hypotenuse of a triangle: A = 412, B = 60	Hypotenuse =	_____	9
10)	Volume of a sphere: r = 29	Volume =	_____	12
11)	Volume of a cone: r = 12, h =19	Volume =	_____	14

Give the answer to Q12 as an exact fraction, or as an integer if appropriate.

12)	Volume of a pyramid: l = 134 w = 375 h = 451	Volume =	_____	13

Q 13-18: Ratio calculations.

Each of the following has an exact answer.

13)	43 / X = 215 / 2150	X =	_____	2
14)	215 / 7955 = 3010 / X	X =	_____	3
15)	1585 / 155705 = 15850 / X	X =	_____	5
16)	6748 / 1275372 = 121464 / X	X =	_____	8
17)	X / 13306680 = 809190 / 239520240	X =	_____	11
18)	X / 2449185 = 467904 / 156747840	X =	_____	13

Q 19-24: Missing information.

Fill in the missing information in each case.
The symbol '?' shows <u>one</u> missing digit.
The symbol '#' shows <u>any number</u> of missing digits.

19)	7224 / # = 84	_____	2
20)	53^2 + 18^2 = 3??3	_____	3
21)	Cube root of 421875000 = ??0	_____	3
22)	91376 + 3774 - # = 48705	_____	4
23)	(30 + (9 x #)) x (897 - 63) = 227682	_____	12
24)	1470 x 900 / 6300 = #	_____	12

Total value: 200

SECTION 17: EXTENSIONS TO PREVIOUS SECTIONS

For Q1 – Q7, all answers are required to their full accuracy.

1) 7460254117957 + 3307078197031 + 4643575910023 + 8897949032205 + 5533388107340 + 3260027917054 = _____ 15

2) 238259813536218 - 158168241867183 = _____ 6

3) 3174712.76876 + 6215464.1449 + 7702115.8119 + 79819075.6521 + 9303042.4343 + 2485093.65106 = _____ 12

4) 3145625617 - 1027028528 + 1653275479 - 1204420714 + 6709092643 - 4103266647 _____ 17

5) 1990 x 34071 x 92485 = _____ 50

6) 509571337834282 / 214646730343 = _____ 18

7) 82 x 435 x 718 x 382 x ? = 1868634159720 ? = _____ 32

For Q8, give your answer to the nearest integer.

8) 42814683.8 x 9524105.2 = _____ 50

For Q9, give your answer to 6 significant figures

9) 194413601.75 / 7.387349 = _____ 50

For Q10, give the prime factors of the number. No prime factor greater than 107 is used.

10) 920351061 _____ 50

For Q11-13, give each answer in its simplest form.

11) 411 71/156 - 405 41/94 = _____ 20

12) 89 74/121 - 42 65/142 + 88 47/52 = _____ 30

13) 199 17/21 x 198 25/42 = _____ 50 1

Amount of time passed: For Q14, give the exact number of seconds between the two moments stated.

14) From 15:02:06 on August 6, 1919 to 13:33:05 on November 19, 1927 _____ 50

For Q15, give x to 4 significant figures.

15) 1/69 - 1/144 = 1/ x x = _____ 20

16) What is the remainder following the inexact integer division of 118516005 / 514 _____ 30

17) What is the exact cube root of 685942283173888? _____ 19

18) What is the 7th root of 9621 to three significant figures? _____ 13

19) What is the 9th root of 792601750 to two decimal places? _____ 18

20) 6840A (base 12) x 9A30 (base 14) = (in base 10) _____ 50

Q21 is the sum of 2, 3 or 4 exact squares. There may be more than one answer; only one is required. Zeros may not be used, and <u>at least</u> two numbers must be given. Give the numbers to be squared, not the actual squares.

21) 33153214 _____ 50

22) (79 + (95 x 79)) x (36662 - 10409) = _____ 25

23) (99 + (94 x 94)) x (49003 - 15517) = _____ 25

For Q24-26, place the numbers in order of increasing value.

24) 47/59 0.710, 11/25, 1/2, 53/86, 31/54 _____ 10

25) 5/18, 20/47, 5/8, 67/89, 41/83, 19/52, 13/19, 51/91 _____ 18

26) 29/45, 40/97, 44/87, 47/86, 33/46, 31/38, 7/39, 4/11, 13/47 _____ 22

For Q27, calculate the value to the nearest integer

27) 5 9/10 ^ 5 = _____ 35

28) 3528 x 1904 / 17136 = _____ 15

Total value: 800

SECTION 18: SURPRISE TASKS

1) Give the mod 101 of 2^50 _____ 20

2) How many figures does 97^97 have? _____ 20

Total value: 40

SUMMARY OF THE TEST PAPER:

Section	Subject	Questions	Total value
1A	Integer Additions	13	47
1B	Integer Subtractions	18	47
1C	Decimal Additions & Subtractions	18	47
1D	Mixed Additions & Subtractions	15	59
2	Integer Multiplications	20	200
3	Exact Divisions	22	200
4	Approximate Multiplications	12	200
5	Approximate Divisions	15	200
6	Prime Factors	14	200
7A	Fraction Additions	7	87
7B	Fraction Subtractions	5	28
7C	Fraction Adds & Subs Mixed	6	85
8A	Fraction Multiplications	7	144
8B	Fraction Divisions	4	56
9A	Calendar Calculations	12	69
9B	Time Calculations	10	131
10	Miscellaneous	18	200
11A	Exact Roots	18	75
11B	Inexact Roots	20	125
12	Base Conversions	13	200
13	Sums of Squares	22	200
14	Brackets	19	200
15	Value Comparisons	16	200
16	Miscellaneous 2	24	200
17	Extensions	28	800
18	Surprise Tasks	2	40
TOTAL		378	4040