VIRGINIA STANDARDS OF LEARNING

Spring 2006 Released Test

GRADE 7 MATHEMATICS

CORE 1

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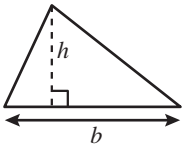
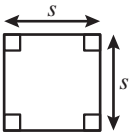
Grade 7 Mathematics Formula Sheet

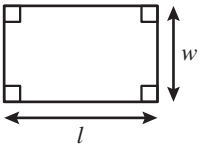
Geometric Formulas



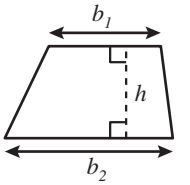
$A = \frac{1}{2}bh$



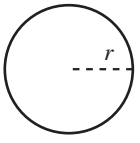
$p = 4s$
$A = s^2$



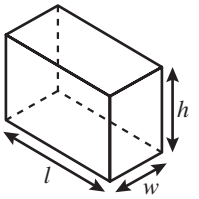
$p = 2l + 2w$
$A = lw$



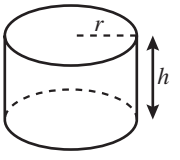
$A = \frac{1}{2}h(b_1 + b_2)$



$C = 2\pi r$
$A = \pi r^2$



$V = lwh$
$S.A. = 2lw + 2lh + 2wh$



$V = \pi r^2 h$
$S.A. = 2\pi rh + 2\pi r^2$

Abbreviations

milligram	mg
gram	g
kilogram	kg
milliliter	mL
liter	L
kiloliter	kL
millimeter	mm
centimeter	cm
meter	m
kilometer	km
square centimeter	cm^2
cubic centimeter	cm^3

ounce	oz
pound	lb
quart	qt
gallon	gal.
inch	in.
foot	ft
yard	yd
mile	mi.
square inch	sq in.
square foot	sq ft
cubic inch	cu in.
cubic foot	cu ft

area	*A*
perimeter	*p*
circumference	*C*
volume	*V*
total surface area	*S.A.*

year	yr
month	mon
hour	hr
minute	min
second	sec

Pi

$\pi \approx 3.14$

$\pi \approx \frac{22}{7}$

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DIRECTIONS
Read and solve each question. Then mark the space on your answer document for the best answer.

SAMPLE

Which is less than 1.0618?

A 1.1061
B 1.0608
C 1.1618
D 1.0628

1 Patti answered 12 of the 15 questions on her test. What percent of the questions did Patti answer?

A 60%
B 75%
C 80%
D 84%

2 During a winter's night, the low temperature was recorded at 19°F. The wind-chill temperature that same night was −7°F. What was the difference between the wind-chill temperature and the low temperature?

F 7°F
G 12°F
H 25°F
J 26°F

3 Jerri was looking at a map with the following scale indicator.

$\frac{1}{2}$ **inch = 3 miles**

Jerri measured $3\frac{1}{8}$ **inches between two towns on the map. What is the distance in miles between the two towns?**

A $18\frac{3}{4}$ miles

B $9\frac{3}{8}$ miles

C $3\frac{5}{8}$ miles

D $\frac{1}{2}$ mile

GO ON

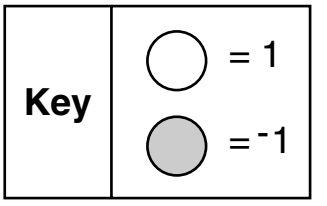
4 The Wheelers' bill at a restaurant is $63.00. How much money should Mr. Wheeler leave as a tip if he plans to tip 15%?

F $78.00
G $72.45
H $9.45
J $5.00

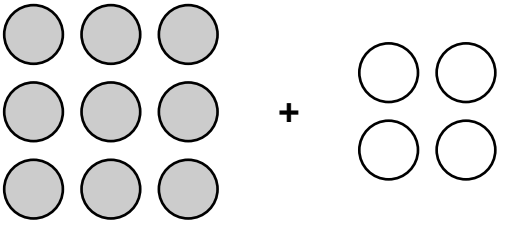
5 A tree casts a shadow 9 meters long. At the same time, a building 54 meters tall casts a shadow 21 meters long. To the nearest meter, what is the height of the tree?

A 4 m
B 18 m
C 23 m
D 126 m

6



Using the key above as a guide, what is the result of the operation in the model below?



F $^{-}13$
G $^{-}5$
H 5
J 13

GO ON

7 Chris put $1,500 in a savings account at an annual interest rate of 5%. If Chris does not deposit or withdraw any money, what is the amount of interest Chris will earn the first year her money is in the savings account?

A $750

B $500

C $75

D $50

Do not turn the page until your teacher tells you to do so.

STOP

8 **A store advertisement reads "Going Out of Business Sale. Everything is $\frac{5}{8}$ off." What percent is $\frac{5}{8}$?**

F 16%

G 37.5%

H 58%

J 62.5%

9 **When simplifying the following, using order of operations, which operation should be performed first?**

$$8 - 4 \div 2 + 3 \cdot 5$$

A $8 - 4$

B $4 \div 2$

C $2 + 3$

D $3 \cdot 5$

10 **Daphne wrote the fractional part of the quizzes she answered correctly.**

Quiz	Score
1	$\frac{4}{5}$
2	$\frac{5}{11}$
3	$\frac{3}{7}$
4	$\frac{7}{9}$

Which lists these quiz scores in order from least to greatest?

F $\frac{3}{7}, \frac{4}{5}, \frac{5}{11}, \frac{7}{9}$

G $\frac{4}{5}, \frac{3}{7}, \frac{7}{9}, \frac{5}{11}$

H $\frac{3}{7}, \frac{7}{9}, \frac{5}{11}, \frac{4}{5}$

J $\frac{3}{7}, \frac{5}{11}, \frac{7}{9}, \frac{4}{5}$

GO ON

11 **Which number sentence illustrates the commutative property of multiplication?**

A $14 + (13 \cdot 7) = 14 + (7 \cdot 13)$

B $14 + (13 \cdot 7) = 13 + (14 \cdot 7)$

C $14 + (13 \cdot 7) = 14 \cdot 13 + 14 \cdot 7$

D $14 + (13 \cdot 7) = (14 + 13) \cdot 7$

12 $$\frac{1}{7} \cdot y = \frac{1}{7}$$

If the number sentence is true, then y is the —

F additive identity

G additive inverse

H multiplicative identity

J multiplicative inverse

13 $$\frac{10 + 30 \div 5}{28 \div 7 \cdot 2} =$$

A 8

B 4

C 2

D 1

14 **A business sold for 45 million dollars. What is 45 million expressed in scientific notation?**

F 4.5×10^6

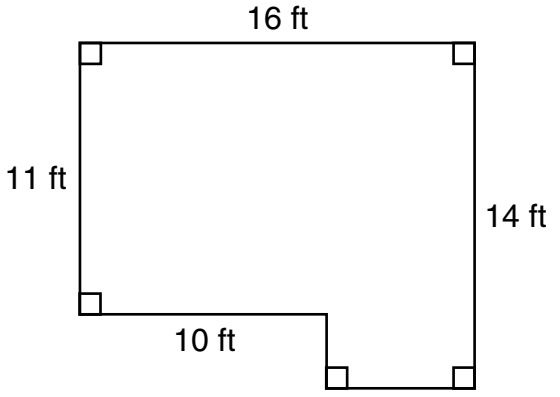
G 4.5×10^7

H 4.5×10^8

J 4.5×10^9

GO ON

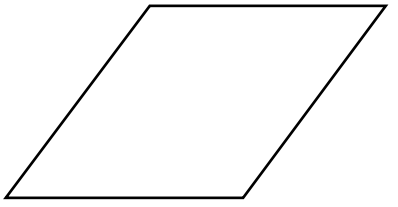
15 **Katie is going to carpet her living room floor and drew the diagram shown.**



What is the minimum number of square feet of carpet she will need?

A 51 sq ft
B 60 sq ft
C 194 sq ft
D 244 sq ft

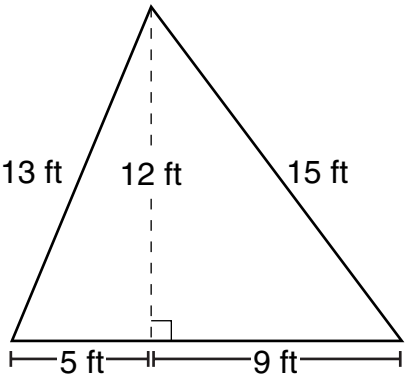
16



If all sides of the polygon pictured are equal in length, the polygon is most likely a —

F square
G rhombus
H rectangle
J nonagon

17



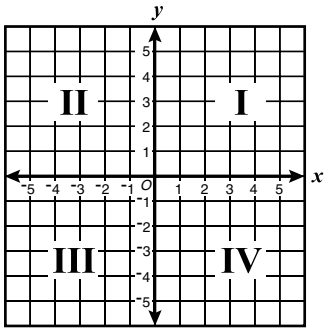
What is the total area of the figure shown?

A 42 sq ft
B 84 sq ft
C 135 sq ft
D 168 sq ft

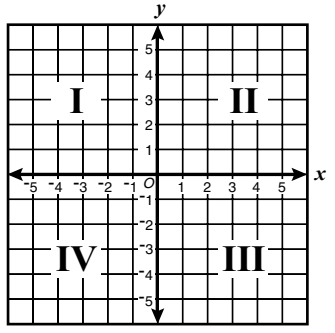
GO ON

18 Which coordinate grid has the quadrants correctly labeled?

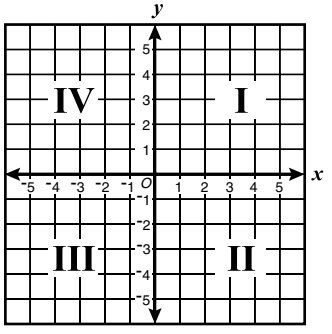
F



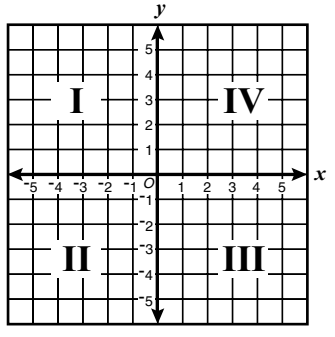
G



H



J



19 A cylinder-shaped barrel has a diameter of 3 feet and a height of 4.5 feet. If the barrel is empty, which is closest to the minimum amount of water needed to completely fill the barrel?

A 32 cu ft
B 49 cu ft
C 71 cu ft
D 98 cu ft

20 Mark correctly drew a heptagon on the board. How many interior angles does Mark's heptagon have?

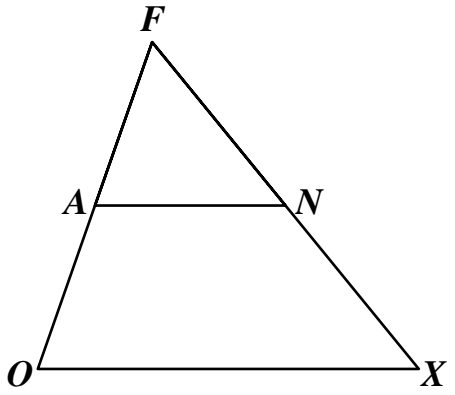
F 6
G 7
H 8
J 9

21 A circular plate has a radius of 7 inches. Which is closest to the area of the plate?

A 39 sq in.
B 44 sq in.
C 138 sq in.
D 154 sq in.

GO ON

22 Triangle *FOX* is similar to triangle *FAN*.

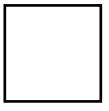


Which side of triangle *FOX* corresponds to side $\overline{FA}$?

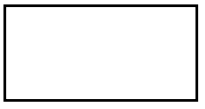
F $\overline{FO}$
G $\overline{AO}$
H $\overline{FN}$
J $\overline{NX}$

23 Which polygon is *not* a quadrilateral?

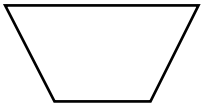
A



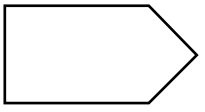
B



C



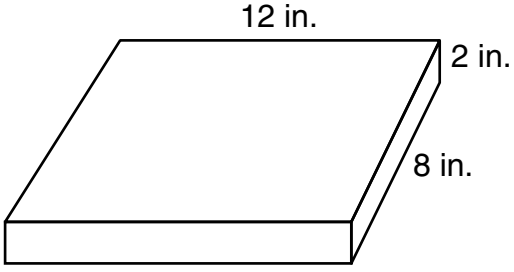
D



24 On a regular coordinate grid, the point $(^{-}7, 10)$ is in which quadrant?

F I
G II
H III
J IV

25 Carl is covering the rectangular prism-shaped box with cloth.

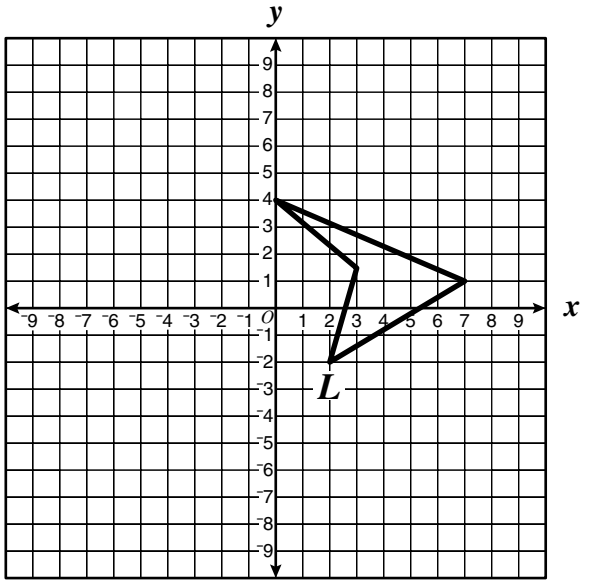


What is the minimum amount of cloth Carl needs to cover the entire box?

A 96 sq in.
B 136 sq in.
C 192 sq in.
D 272 sq in.

GO ON

26 Translate the figure horizontally $^{-}5$ units.



Which best describes the location of the image of vertex *L*?

F $(^{-}3, ^{-}2)$

G $(^{-}2, ^{-}3)$

H $(2, ^{-}7)$

J $(^{-}7, 2)$

27 A summer camp offers different choices at lunch.

Lunch Choices

Main Dish	Side	Drink
Hamburger	Salad	Milk
Turkey sandwich		Iced tea
Chicken strips	Fruit	Juice

How many different lunch combinations consisting of 1 main dish, 1 side dish, and 1 drink are possible?

A 6

B 9

C 18

D 27

GO ON

28 **The scores Brianna earned on 4 of the 5 science tests she has taken so far this year are listed.**

95, 90, 85, 95

She wants the mean of all 5 of her test scores to be 90. What does Brianna need to score on the 5th test to get exactly a mean of 90?

F 90

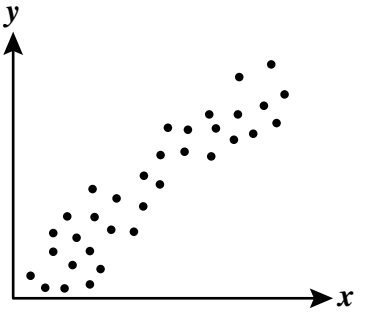
G 85

H 80

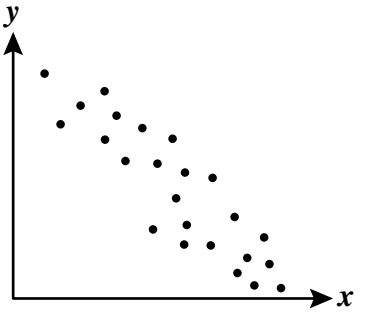
J 75

29 **Which scatterplot shows a positive relationship between x and y?**

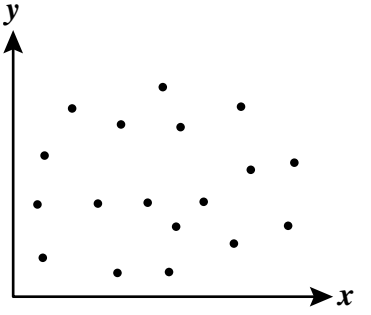
A



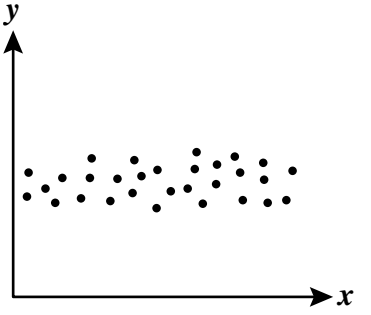
B



C



D



30 **A regular card deck contains 52 cards, 4 of which are aces. Assuming the cards are dealt randomly, what is the probability that the first card dealt will be an ace?**

F $\frac{1}{52}$

G $\frac{1}{13}$

H $\frac{1}{12}$

J $\frac{4}{13}$

31 **Look at the table.**

Sports Participation

Sport	Number of Students
Volleyball	26
Basketball	68
Soccer	68
Baseball	62

What is the median number of students participating in a sport?

A 56

B 62

C 65

D 68

32 **The six faces of a fair cube are numbered 1 through 6. If the cube is rolled 300 times, what is the expected number of times a 5 will land face-up?**

F 50

G 100

H 200

J 250

33 **Mark has a basket of 40 yellow tennis balls and 35 white tennis balls. What is the probability that the next tennis ball he randomly chooses will be yellow?**

A $\frac{8}{7}$

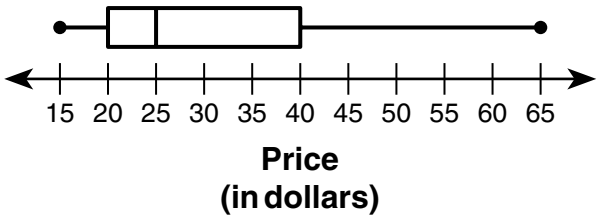
B $\frac{7}{8}$

C $\frac{8}{15}$

D $\frac{7}{15}$

GO ON

34



Which measures can be determined using data presented in a box-and-whisker plot?

F The mean and the range
G The mean and the mode
H The median and the mode
J The median and the range

35 The number of customers in various age groups that went to Oak Hills Library last Tuesday morning is recorded in the frequency distribution.

Oak Hills Library Customers

Age Group	Tally	Frequency	Cumulative Frequency
1 to 10	𝍸 𝍸 | | |	13	13
11 to 20	𝍸 | | |	8	21
21 to 30	𝍸 𝍸 𝍸 | |	17	38
31 to 40	𝍸 | | | |	9	47
41 to 50	𝍸 𝍸 𝍸 | | |	18	65

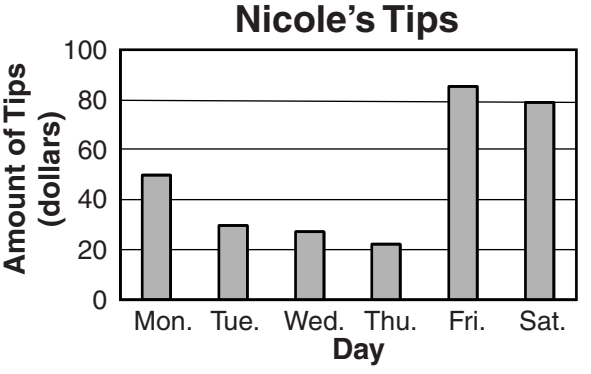
Which age group had twice as many customers as the 31- to 40-year-old age group?

A 1 to 10
B 11 to 20
C 21 to 30
D 41 to 50

36 Lewis' restaurant offers a dinner special that consists of a main dish, a vegetable, a salad, and a roll. Lewis' has 4 main dishes, 7 vegetables, 1 salad, and 1 type of roll to choose from. Which shows the total number of different dinner special combinations that Lewis' offers?

F $4 + 7 + 1 + 1$
G $4 \cdot 7 \cdot 2$
H $4 + 7$
J $4 \cdot 7 \cdot 1 \cdot 1$

37 The graph shows the amount Nicole received in tips while working at a restaurant for six days.



Which day's tip amount is closest to the mean (average) for the six days?

A Monday
B Wednesday
C Thursday
D Friday

38 Look at the table.

Lopez Family

Family Member	Age (in years)
Grandmother	55
Grandfather	54
Mother	33
Father	33
Son	8
Daughter	5

Based on the ages of the Lopez family members, which of the following has the *greatest* value?

F Mean
G Median
H Mode
J Range

39 What is the common difference of the arithmetic sequence shown below?

$$-5, -1, 3, 7, \ldots$$

A 2
B 4
C 6
D 8

40 Which of the following would *not* be classified as an expression?

F $5 + 4y$
G $x - 1 = 7$
H $4 + 1$
J $3abc$

GO ON

41 What is the value of p that makes the following true?

$$p - (^{-}4) = 8$$

A $^{-}12$
B $^{-}4$
C 4
D 12

42 Which represents the phrase shown?

The product of four and a number, decreased by seven

F $4(x - 7)$
G $4(7 - x)$
H $7 - 4x$
J $4x - 7$

43 Which table contains *only* values that satisfy the following?

$$y = x - 1$$

A

x	y
-1	-2
0	-1
1	2

B

x	y
-1	0
0	1
1	2

C

x	y
0	1
1	0
2	1

D

x	y
0	-1
1	0
2	1

GO ON

44 **Brittany is $\frac{1}{4}$ Caroline's age. If Brittany is 2 years old, what is Caroline's age?**

F 1 year old
G 2 years old
H 4 years old
J 8 years old

45 **Which phrase best represents the following?**

$$2x - 8$$

A Eight less than twice a number
B Twice a number less than eight
C Eight less than a number squared
D A number squared less than eight

46 **Which represents *all* the values for a that make the following true?**

$$a + 8 \geq 4$$

F $a \leq -4$
G $a \geq -4$
H $a \leq -12$
J $a \geq -12$

47 **Which statement is *false*?**

A An equation must have an equal symbol.
B An equation states that two expressions are equal.
C An equation always contains variables.
D An equation always contains terms.

48 **What is the 6th term of the geometric sequence shown?**

80, 40, 20, . . .

F 1
G $1\frac{1}{4}$
H $2\frac{1}{2}$
J 5

GO ON

49 **What value of d makes the following number sentence true?**

$$\frac{d}{3} = -27$$

A -81

B -9

C 9

D 81

50

Twice the number of students in Juan's class divided by five is ten.

Which best represents the sentence above?

F $\frac{2j}{5} = 10$

G $\frac{j^2}{5} = 10$

H $\frac{2j}{5} + 10$

J $\frac{j^2}{5} + 10$

STOP

Answer Key

Test Sequence Number	Correct Answer	Reporting Category	Reporting Category Description
1	C	006	Computation and Estimation
2	J	006	Computation and Estimation
3	A	006	Computation and Estimation
4	H	006	Computation and Estimation
5	C	006	Computation and Estimation
6	G	006	Computation and Estimation
7	C	006	Computation and Estimation
8	J	005	Number and Number Sense
9	B	005	Number and Number Sense
10	J	005	Number and Number Sense
11	A	005	Number and Number Sense
12	H	005	Number and Number Sense
13	C	005	Number and Number Sense
14	G	005	Number and Number Sense
15	C	007	Measurement and Geometry
16	G	007	Measurement and Geometry
17	B	007	Measurement and Geometry
18	F	007	Measurement and Geometry
19	A	007	Measurement and Geometry
20	G	007	Measurement and Geometry
21	D	007	Measurement and Geometry
22	F	007	Measurement and Geometry
23	D	007	Measurement and Geometry
24	G	007	Measurement and Geometry
25	D	007	Measurement and Geometry
26	F	007	Measurement and Geometry
27	C	008	Probability and Statistics
28	G	008	Probability and Statistics
29	A	008	Probability and Statistics
30	G	008	Probability and Statistics
31	C	008	Probability and Statistics
32	F	008	Probability and Statistics
33	C	008	Probability and Statistics
34	J	008	Probability and Statistics
35	D	008	Probability and Statistics
36	J	008	Probability and Statistics
37	A	008	Probability and Statistics
38	J	008	Probability and Statistics
39	B	009	Patterns, Functions, and Algebra
40	G	009	Patterns, Functions, and Algebra
41	C	009	Patterns, Functions, and Algebra
42	J	009	Patterns, Functions, and Algebra
43	D	009	Patterns, Functions, and Algebra
44	J	009	Patterns, Functions, and Algebra
45	A	009	Patterns, Functions, and Algebra
46	G	009	Patterns, Functions, and Algebra
47	C	009	Patterns, Functions, and Algebra
48	H	009	Patterns, Functions, and Algebra
49	A	009	Patterns, Functions, and Algebra
50	F	009	Patterns, Functions, and Algebra

Grade 7 Mathematics, Core 1

If you get this many items correct:		Then your converted scale score is:
0		000
1		030
2		087
3		122
4		147
5		168
6		185
7		200
8		213
9		225
10		236
11		247
12		257
13		266
14		275
15		283
16		291
17		299
18		307
19		314
20		322
21		329
22		336
23		343
24		350
25		357
26		365
27		372
28		379
29		386
30		393
31		**400**
32		407
33		415
34		423
35		431
36		439
37		448
38		457
39		467
40		477
41		488
42		**500**
43		513
44		528
45		545
46		565
47		590
48		600
49		600
50		600