JUNIOR RELAY 1998

R 1 (4 points) (96 points remaining)

What decimal fraction is exactly three quarters of the way along a number line from 0·4 to 0·78 starting from 0·4?

Answer: _____

R 2 (5 points) (91 points remaining)

A rectangular tank with a base of 4 metres by 3 metres and a height of 3 metres contains water to a height of 1 metre. A lead cube of side 1 metre is fully submerged in the tank. By how much does the depth of the water rise? Express your answer in centimetres?

Answer: _____

R 3 (5 points) (86 points remaining)

A delivery van takes a parcel to a customer and then returns to the depot by the same route. On the way to the customer the van travels at an average speed of 40 km/h whereas on the way back the van averages 60 km/h. Calculate the average speed for the round trip of 90 km.

Answer: _____

R 4 (6 points) (80 points remaining)

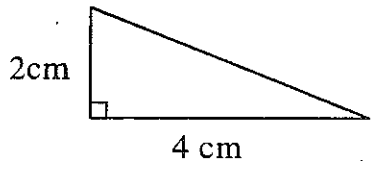
The area of a circle is to be increased by 44%. By what percentage must the radius be increased?

(Use $\pi \doteq 3{\cdot}14$)

Answer: _____

R 5 (4 points) (76 points remaining)

This scale drawing represents a triangular paddock.
What is the area of the paddock in hectares?



Scale 1:20000

Answer: _____

R 6 (5 points) (71 points remaining)

The ratio of two integers is 5:2. If 10 is added to each integer, the ratio is 5:3.
What are the two original integers?

Answer: _____

R 7 (5 points) (66 points remaining)

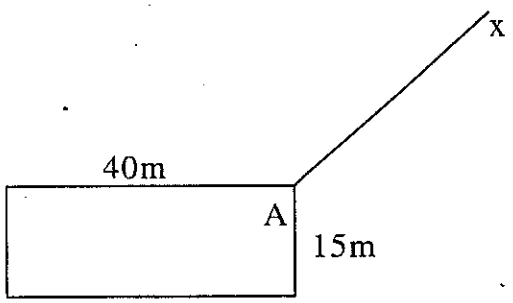
A bag contains coloured marbles. Some are blue, some green, and some are red. The probability of drawing a green marble is 0·3, and the probability of drawing a blue marble is 0.25. If the bag contains 12 green marbles, how many red marbles are there?

Answer: _____

R 8 (6 points) (60 points remaining)

A goat is tethered by a 30 metre rope to the corner (A) of a rectangular paddock 40m by 15m. The paddock is fenced. The goat is outside the fence and cannot reach through the fence. What is the maximum area outside the paddock over which the goat may graze?

(to the nearest m^2) (Use $\pi \doteq 3{\cdot}14$)



Answer: _____

R 9 (4 points) (56 points remaining)

A regular plane figure has 100 sides. It is a closed figure.
What is the exact size of each angle in degrees?

Answer: _____

R 10 (5 points) (51 points remaining)

In the expression $a = b - \sqrt{cd}$

Make d the subject. (i.e. d = ...)

Answer: _____

R11 (5 points) (46 points remaining)

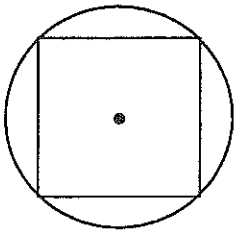
24 cubes are arranged into 4 piles. The first pile has 3 more than the second, the second has 1 fewer than the third while the fourth pile has twice as many cubes as the second pile. How many cubes are there in each pile?

Answer: _____

R 12 (6 points) 40 points remaining)

A square of side $5\sqrt{2}$ cm in inscribed in a circle. Find the circumference of the circle in cm.

(Use $\pi \doteqdot 3{\cdot}14$)



Answer: _____

R 13 (4 points) (36 points remaining)

The speed of light if given as 3.00×10^8 m/s. A "light year" is the distance light would travel in one year. How many digits would be needed to express, in metres, the distance in a light year?

(1 year = 365 days)

Answer: _____

R14 (5 points) 31 points remaining)

The combined weight of Jenny and Craig is 135 kg. In a month's time Jenny has lost 10% While Craig has gained 10%. Their combined weight is now 133.5 kg. How much does Craig weigh now?

Answer: _____

R15 (5 points) (26 points remaining)

A town had a 20% increase in population in 1992, a 30% increase in 1993, and a 50% decrease in 1994. What was the overall percentage change from 1992 to 1994?

Answer: _____

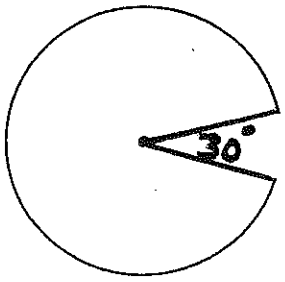
R 16 (6 points) (20 points remaining)

The volume of cylinder A is 15 times the volume of cylinder B. The radius of cylinder A is 4 times the radius of cylinder B. How high is cylinder A if cylinder B is 8 cm high?

Answer: _____

R 17 (4 points) (16 points remaining)

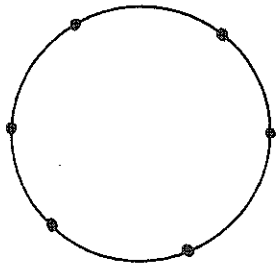
A circle has a piece removed from it as shown in the diagram. Find the perimeter of the remaining sector if the circle's radius was 15 cm. (Use $\pi = 3{\cdot}14$)



Answer: _____

R 18 (5 points) (11 points remaining)

Using only the points on the circumference of this circle as vertices, how many different triangles can be made?



Answer: _____

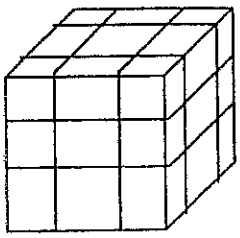
R 19 (5 points) (6 points remaining)

If a:b = 3:1 and b:c = 1:5, what is the value of $\frac{2a + 3b}{4b + 3c}$?

Answer: _____

R 20 (6 points) (0 points remaining)

A cube is painted black and cut into 27 smaller cubes. The smaller cubes are then put in a box and one is chosen at random. What is the probability that the chosen cube, when rolled like a die, will have its uppermost face black?



Answer: _____

MATHS TEAM CHALLENGE (1998)
Relay Answer sheet
JUNIOR SECONDARY

Question	Answer	Attempts x or / 6 5 4 3 2 1	Score	Progressive Score
1 (4 points)	0.685			
2 (5 points)	$8^1/_3$; 8.3 cm			
3 (5 points)	48km/h			
4 (6 points)	20%; 20			
	CHANGE			
5 (4 points)	32ha; 32			
6 (5 points)	8, 20; 20 and 8			
7 (5 points)	18 red			
8 (6 points)	$2296m^2$			
	CHANGE			
9 (4 points)	176.4°			
10 (5 points)	$d = \frac{(b-a)^2}{c}$; $\frac{b^2 - 2ab + a^2}{c}$			
11 (5 points)	7, 4, 5, 8			
12 (6 points)	31.4cm; 31.4			
	CHANGE			
R13 (4 points)	16			
R14 (5 points)	66kg			
R15 (5 points)	22% decrease			
R16 (6 points)	$7^1/_2$cm; 7.5cm			
	CHANGE			
R17 (4 points)	116.35cm			
R18 (5 points)	10			
R19 (5 points)	9/19 or 9:19			
R20 (6 points)	1/3; 0.3; 0.33....			
			TOTAL	

School: _____

Team 1: ❑ Team 2: ❑