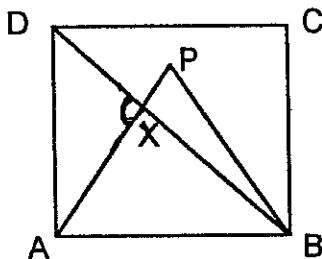


JUNIOR RELAY 1997

R. 1 (4 points)

(96 points remaining)

In the figure, ABCD is a square and the triangle PAB is equilateral. Calculate the size of angle DXA.



R. 2 (5 points)

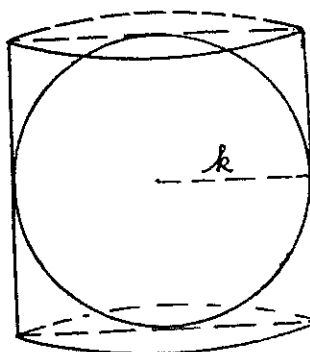
(91 points remaining)

A car travels for t hours at the rate of v km/hr and then for T hours at V km/hr. What was the average speed for the whole journey?

R. 3 (5 points)

(86 points remaining)

A sphere of radius k units is inscribed in a cylinder so that the sphere just fits snugly inside the cylinder. Find the ratio of the volume of the sphere to the volume of the cylinder.



R. 4 (6 points)

(80 points remaining)

I wish to buy 100 pets. Cats cost \$5 each, rabbits \$1 each, and goldfish are 5 cents each. If I spend exactly \$100 buying the 100 pets, how many of each did I buy?

R. 5 (4 points)

(76 points remaining)

If $\frac{a}{b} = \frac{3}{4}$ find the value of $\frac{a+b}{b}$

R. 6 (5 points)

(71 points remaining)

A rectangular swimming pool of constant depth measures 25 m long by 15 m wide. It is being filled from pipes which deliver 500 litres of water per minute. How long will it take the water level to rise 10 cm?

R. 7 (5 points)

(66 points remaining)

A soccer ball has a diameter of 24 cm. It is placed on the goal line of a 100 metre field. What will be the minimum number of times it must be rolled over before it will reach the other goal line at the far end of the field. Give your answer to the nearest whole number of turns required for the ball to reach the other end.

R. 8 (6 points)

(60 points remaining)

A cyclist is riding a bicycle with a ratio of pedal revolutions to wheel revolutions of 1:6. If the diameter of a wheel is 70 cm, how long (to the nearest minute) would it take the cyclist to travel 40 km if the cyclist averaged 32 pedal revolutions per minute?

R. 9 (4 points)

(56 points remaining)

The average of 20 measurements was found to be 2.38. After the calculation, it was discovered that one of the measurements had been incorrectly copied as 9.56 instead of 5.69. Find the correct average of the 20 measurements.

R. 10 (5 points)

(51 points remaining)

The distance from the Earth to the Sun is about 1.5×10^{11} metres. Light travels at about 3×10^8 metres per second. How long does it take the light from the Sun to reach the Earth in minutes.

R. 11 (5 points)

(46 points remaining)

If $qr + pq - 1 = 0$ express r in terms of p and q .

R. 12 (6 points)

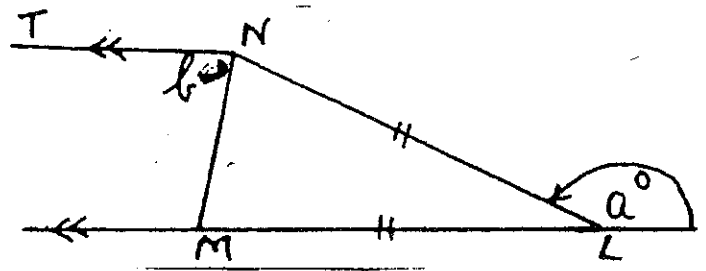
(40 points remaining)

In a test all the questions are of equal value. Peter says he answered 9 of the first 10 questions correctly and got three-tenths of the remaining questions correct. How many questions were there in the test if Peter's result was 50%.

R. 13 (4 points)

(36 points remaining)

In the diagram, $LM = LN$ and NT is parallel to LM . Find the relation between a° and b° .



R. 14 (5 points)

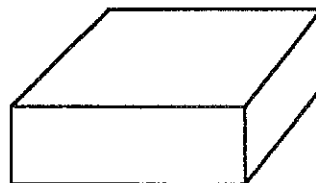
(31 points remaining)

A Compact Disc player was sold for \$243 by a retailer. If he made 35% profit on his cost price, how much did the player cost the retailer?

R. 15 (5 points)

(26 points remaining)

Three faces of a rectangular prism have areas of 15 cm^2 , 10 cm^2 and 6 cm^2 respectively. Find the volume of the prism in cm^3 .



R. 16 (6 points)

(20 points remaining)

An equilateral triangle has an area of 20 cm^2 .
Find the length of its sides in cm (to nearest one-tenth of a cm)

R. 17 (4 points)

(16 points remaining)

Make x the subject of the formula

$$y = \sqrt{x^2 + 3}$$

R. 18 (5 points)

(11 points remaining)

A wheel rotates freely at 8 revolutions per minute.
Through how many degrees does it rotate in one second.

R. 19 (5 points)

(6 points remaining)

Find the smallest number which when divided by 204, or 306 or 510 will leave a remainder of 6 in each case.

R. 20 (6 points)

(0 points remaining)

A boat travels 20 km upstream in 4 hours. The return trip downstream takes only 3 hours.
If the speed of the current is constant throughout the trip, what was the speed of the current?

MATHS TEAMS CHALLENGE (1997)
RELAY Answer sheet
JUNIOR SECONDARY

Question	Answer	Score
R1 (4 point)	105°	
R2 (5 points)	$\frac{tv + TV}{t + T} \text{ km/hr}$	
R3 (5 point)	2:3 or $\frac{2}{3}$	
R4 (6 points)	19 cats; 1 rabbit; 80 goldfish	
R5 (4 points)	$1\frac{3}{4}$ or 1.75	
R6 (5 point)	75 mins; 1 hr 15 mins	
R7 (5 points)	133 times	
R8 (6 point)	95 minutes; 1 hr 35 mins	
R9 (4 points)	2.1865	
R10 (5 points)	$8\frac{1}{3}$ minutes or 8.3 minutes	
R11 (5 point)	$\frac{pq + 1}{p + q}$ or $(pq + 1) \div (p + q)$	
R12 (6 points)	30 questions	
R13 (4 points)	$a = 2b$	
R14 (5 point)	\$180	
R15 (5 points)	30 cm^3	
R16 (6 point)	6.8 cm	
R17 (4 points)	$x = \pm \sqrt{y^2 - 3}$	
R18 (5 points)	48°	
R19 (5 point)	3066	
R20 (6 points)	$\frac{5}{6} \text{ km/hr}$ or $0.8\dot{3} \text{ km/hr}$	
TOTAL:		

SCHOOL:

Team 1

Team 2