Instructions

QAMT Rockhampton is delighted to make these questions available to you!

You should have received the following :
* Instructions with Score Sheet
* Individual Questions
* Individual Questions Answers
* Relay Questions
* Relay Questions Answers
* Team Questions
* Team Questions Answers Sheet
* Team Questions Answers
* Shoot Out Questions
* Student Participation Certificate
* Teacher PD Certificate

AIMS
The students will:
- advance their interest in creative problem solving
- acquire problem solving skills and processes
- develop teamwork skills
- be highly involved in a session of intellectual fun in a scholarly atmosphere.

FORMAT
The competition consists of five events:

Individual Event	Each student has 3 minutes to individually complete a set of questions without a calculator. This focuses on using mental maths quickly.
Relay Event	Students work in pairs and rotate around as they solve questions. There are 25 questions to be answered in 30 minutes.
Team Event	Each team has 30 minutes to work together and answer 10 questions.
Estimation Event	During the Teams Event, students will be asked an estimation question. Each team has time to confer and furnish their best guess.
Shoot Out Event	Students will compete individually responding to questions read aloud until only one student from each year level remains. This focuses on listening carefully to the question being asked and using mental maths quickly.

TEAMS

A team consists of 5 students in the appropriate year levels. This can be a team where all 5 students are the same year level or mixed teams of different year levels.

MATERIALS

Each student MUST bring:

- a calculator of any type
- pens, pencils, eraser, ruler

SUPERVISORS

One adult or senior student MUST accompany EACH team. They will assist as a Supervisor in all events. This need not be a teacher nor needs any mathematical knowledge but must be Year 10 or older and needs to be able to follow simple instructions given to them. If a team does not have a supervisor, it will be difficult for them to participate.

STUDENT PARTICIPATION CERTIFICATE

Print one per student.

TEACHER PD CERTIFICATE

Print one per teacher involved in organising, hosting, or supervising the challenge.

Every effort has been made to ensure the questions and answers are correct. Adjust as necessary should you find an error.

Individual Event

HOST MATERIALS

* Individual Questions
  - Five pages, single sided page of 20 questions per student.
  - Each student should have different questions.
  - *Copy one set of five per team.*
* Individual Questions Answers
  - One page, double sided.
  - *Copy one per team supervisor. These should not be shown to students.*

STUDENT MATERIALS

* Students should have a pencil or pen.
* No calculators allowed.

PROCEDURE

- Students have 3 minutes to answer as many questions as possible.
- Students work individually. They should not consult or help each other.
- Units are not required.
- Give each student one page face down.
- As the timer is started, students flip over the page and begin work.
- Students stop work after 3 minutes.
- Supervisor collects the five sheets from the team.

Keep them together. Individual sheets do not have space for identification.

- Supervisor should write the Year, School, and Team Number on the Individual Questions Answers sheet.
- Supervisor marks each sheet submitted by students.

SCORING

* Each question is worth one mark. Award full marks even if units are not included.
* Each student can earn a maximum of 20 marks.
* The team can collectively earn a maximum of 100 marks for this event.

Relay Event

HOST MATERIALS

* Relay Questions
  - 25 pages, one question per single sided page
  - *Copy one set per team, single sided and stapled.*
* Relay Questions Answers
  - One page, single sided.
  - *Copy one per team supervisor. These should not be show to students.*

STUDENT MATERIALS

* Students should have a pencil or pen.
* Calculators are allowed.
* Spare scribble paper may be used, although each question page should have enough space for working out.

PROCEDURE

- Students have 30 minutes to complete as many questions as possible.
- Students work in pairs with a pivot on the end and rotate, as per the instructions on the next page.
- Units are required when applicable.
- Supervisor should write the Year, School, and Team Number on the Relay Questions Answers sheet.
- Supervisor keeps score, as per the instructions on the next page.
- Question is incorrect if units are not included.

SCORING

* Each question is worth a maximum of 8 points.
* The team can collectively earn a maximum of 200 points for this event.

Queensland Association of Mathematics Teachers – Rockhampton Branch
Maths Teams Challenge 2020

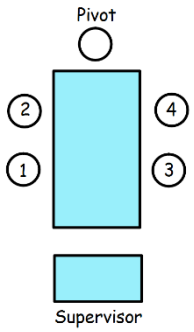
Supervisor's Instructions - RELAY Event

Equipment
1 set of Relay Questions – questions 1 to 25 arranged in the correct order
1 Relay Answer / Score Sheet *(Please ensure that this sheet CANNOT be seen by students AT ANY TIME)*

Identification of Teams
On the Answer Sheet:
CIRCLE the appropriate YEAR LEVEL
WRITE the SCHOOL NAME and TEAM NUMBER

Procedure
Team splits into two pairs and a "Pivot".

One pair should be seated on the left side of the table (positions 1 and 2) and one pair should be seated on the right side of the table (positions 3 and 4). The fifth student should be standing at the end of the table in the "Pivot" position.



⇒ The supervisor hands Q1 to players in Positions 1 & 2, and Q2 to players in Positions 3 & 4. The players in each pair work collaboratively. Input from the other pair or the Pivot is **NOT** permitted.

⇒ Players write their answers on the question sheet and hand it to the supervisor for marking. The marker records the answer as correct or incorrect in the appropriate column on the Relay Event Score Sheet.

⇒ Each time the pair of players in Positions 1 & 2 completes a question by getting it correct, or has 3 incorrect answers, or passes, the player in the Pivot Position moves to Position 2 and that player moves to Position 1. The player in Position 1 moves to the Pivot Position.

⇒ Similarly, each time the pair of players in Positions 3 & 4 complete a question by getting it correct, or has 3 incorrect answers, or passes, the player in the Pivot Position moves to Position 4 and that player moves to Position 3. The player in Position 3 moves to the Pivot Position.

⇒ Each time a question is answered correctly, or has been answered incorrectly 3 times, or has been passed by a pair, and the players have rotated, the supervisor hands the next question to the new pair.

This process continues until either (a) time has run out or (b) all questions have been attempted.

When the instruction to BEGIN is given, the pair of students on the left is given Question 1 and the pair of students on the right is given Question 2.

The Pivot cannot give any assistance to either pair working on a question, and the pairs cannot assist each other or exchange questions.

PASSED QUESTIONS MAY NOT BE ATTEMPTED LATER.

Time Allowed
The relay event will run for about 45 minutes. Students have approximately 30 or 40 minutes to complete as many of the 25 questions available.

If the team has answered all questions before time has expired, the event continues for all other teams. That is, the event is not simply a 'race'. Encourage students to further review the questions, but they cannot score any more points.

Scoring
For each Relay question circle the score box on the ANSWER SHEET as follows:

If the answer provided on the FIRST attempt is CORRECT
8 points

If the answer provided on the SECOND attempt is CORRECT
6 points

If the answer provided on the THIRD attempt is CORRECT
4 points

If the answer provided on the THIRD attempt is INCORRECT
OR
If the team chooses to PASS on a question at any time
0 points

When an answer is presented for marking, you may only state CORRECT or INCORRECT and the number of the attempt. No hints or guidance may be given to the students, even if it is a second or third attempt.

When time is called, if a team has already passed an answer to you, it will be accepted and marked as usual.

You and the team captain will total the number of points for that team and record that result on the bottom of the score sheet.

The score sheet will be collected from you.

Disputes / Confusion
If at any time during the event you have a procedural concern, or you are unsure whether an answer you have received is correct or not, raise your hand to request assistance. A judge will assist you immediately.

Estimation Event

* Runs concurrently with the Team event.

HOST MATERIALS
** Host school will need to find something students can estimate which has a known answer.*

Some ideas are included, but anything similar that host schools have would be fantastic too.
- Fill a jar with lollies/jelly beans/skittles/m&m's/etc.

Students estimate the number of lollies inside the jar.
- Fill a translucent box with marbles or dice.

Students estimate the number of items inside the box.
- Fill a jar with coloured sand.

Students estimate the percentage or proportion of sand in the jar which is a particular colour.
- Print a picture of a pepperoni pizza with lots of pepperoni on it.

Students estimate how many slices of pepperoni are on the pizza by looking at the picture.
- Fill a container with liquid.

Students estimate the number of millilitres of liquid in the jar.

STUDENT MATERIALS
* see the Team Event

PROCEDURES
- As students are working on the Team Questions, bring this around to each team.
- Give them time to view the item and agree on an answer.

-- Each team writes their agreed answer in the Estimation Event Response blank at the bottom of the Team Questions Answer Sheet.

The time each team has to form their guess should be short enough to encourage estimation rather than actually counting and so that every team will have a chance to do so before the Team Event finishes. This can change dependent on the number of teams present and the nature of the estimation being done.

SCORING
* The team with the closest guess to the known answer is declared the winner.
* No points are awarded for this event. It may be used as an overall tie breaker later or just something fun to do. If host schools do not have something for this event, then leave this part of the Team Questions Answer Sheet blank.

Team Event

HOST MATERIALS

* Team Questions
  - One page, double sided. 10 questions.
  - *Copy one per student.*
* Team Questions Answers Sheet
  - One page, single sided.
  - *Copy one per team.*
* Team Questions Answers
  - One page, single sided.
  - *Copy one per supervisor. These should not be shown to students.*

STUDENT MATERIALS

- Students should have a pencil or pen.
- Calculators are allowed.
- Spare scribble paper. The Team Questions sheet does not have room for working out.

PROCEDURE

- Students have 30 minutes to complete as many questions as possible.
- Students work as a team. They may consult with each other.
- Units are required when applicable.
- Give each student a copy of the Team Questions.
- Give each team a copy of the Team Questions Answers Sheet
- Students should write the Year, School, and Team Number on the Team Questions Answers Sheet.
- Before time is up, the team must have written their final agreed answer to each question on the Team Questions Answers Sheet.
- At the end of 30 minutes, the supervisor collects the Team Questions Answers Sheet.
- Mark according to the answers provided. Question is incorrect if no units are included.

SCORING

- Points vary per question. Award points as noted.
- The team can collectively earn a maximum of 200 points for this event.

Supervisors may attempt the questions from a separate copy of the Team Questions. *Make additional copies or the Team Questions and Team Questions Answer Sheet as necessary.*

Shoot Out Event

HOST MATERIALS

* An emcee to read the questions aloud.
* Shoot Out Questions
  - *Copy one set for the emcee.*

STUDENT MATERIALS

* Scribble paper and large or dark pens.

or

* A mini whiteboard with a whiteboard marker

PROCEDURE

- Students work individually. They should not consult with each other. They should cover their responses until directed.
- Host reads the first question aloud clearly to students twice.
- Repeating the question more than twice is not allowed.
- Students listen to the question being asked.
- Students have no more than 10 seconds to answer the question.
- Students write their answer large and legible on a piece of scribble paper or mini whiteboard. This must be large enough for the supervisor to see.
- Units are not required.
- When directed by the host, students hold up their answer for the supervisor to see.
- Host reads out the correct answer.
- Supervisor adjudicate student responses.
- Students with correct answers continue on with the next question.
- Students with incorrect answers are eliminated.
- Host reads aloud the next question clearly twice.
- Continue with this until there is only one student left.

SCORING

- The last remaining student is declared the Shoot-Out Winner.
- No points are awarded for this event. QAMT uses it an event to engage the students as the final scores are being tallied by other facilitators in the room for the results presentation at the conclusion of the competition.

Maths Teams Challenge Score Sheet

Team Number	Individual (out of 100)	Relay (out of 200)	Team (out of 200)	Total (out of 500)

Final Results

Place	Team Number
First	
Second	
Third	

Queensland Association of Mathematics Teachers – Rockhampton Branch
Maths Teams Challenge 2020 – Year 9 & 10 Individual Questions

Student 1

Instructions : Calculators are not allowed. Write the answer to each question on the line provided.

_____ 1) Round 2.9683 to the nearest hundredth.

_____ 2) $-8+3$

_____ 3) $\frac{9}{8} \div 2$

_____ 4) $2 \times 6 - (14 \div 7)$

_____ 5) Factorise completely $4x + 6$.

_____ 6) $\frac{15}{9} - \frac{7}{9}$

_____ 7) 5.7×100

_____ 8) Calculate the mean for the values : 7, 3, 11.

_____ 9) Write $\frac{10}{3}$ as a mixed number.

_____ 10) If $y = 3$, evaluate $y^2 + 4y$.

_____ 11) What is the diameter of a circle with 13 cm radius?

_____ 12) $-18 \div 6$.

_____ 13) Expand $k(k+2)$

_____ 14) Write $\frac{12.6}{10}$ as a percentage.

_____ 15) $\frac{2^{15}}{2^{14}}$

_____ 16) A square has area 36 cm^2. Find its side length.

_____ 17) 5% of 160

_____ 18) If $3x + 4 = 16$, calculate x.

_____ 19) $\left(\frac{980}{\sin\theta}\right)^0$

_____ 20) Convert 6:30 pm to 24 hour time.

Queensland Association of Mathematics Teachers – Rockhampton Branch
Maths Teams Challenge 2020 – Year 9 & 10 Individual Questions

Student 2

Instructions : Calculators are not allowed. Write the answer to each question on the line provided.

_____ 1) Round 3.2698 to the nearest hundredth.

_____ 2) $-6 + 5$

_____ 3) $\frac{4}{3} \div 5$

_____ 4) $5 \times 2 - (16 \div 8)$

_____ 5) Factorise completely $6x + 9$.

_____ 6) $\frac{22}{15} - \frac{8}{15}$

_____ 7) 7.4×100

_____ 8) Calculate the mean for the values : 9, 6, 15.

_____ 9) Write $\frac{13}{4}$ as a mixed number.

_____ 10) If $n = 4$, evaluate $n^2 - 3n$.

_____ 11) What is the diameter of a circle with 14 cm radius?

_____ 12) $22 \div -11$.

_____ 13) Expand $n(n + 5)$

_____ 14) Write $\frac{11.5}{10}$ as a percentage.

_____ 15) $\frac{3^{16}}{3^{15}}$

_____ 16) A square has area 25 cm^2. Find its side length.

_____ 17) 5% of 180

_____ 18) If $5x + 1 = 11$, calculate x.

_____ 19) $\left(\frac{890}{\cos\theta}\right)^0$

_____ 20) Convert 4:30 pm to 24 hour time.

Queensland Association of Mathematics Teachers – Rockhampton Branch
Maths Teams Challenge 2020 – Year 9 & 10 Individual Questions

Student 3

Instructions : Calculators are not allowed. Write the answer to each question on the line provided.

_____ 1) Round 8.6293 to the nearest hundredth.

_____ 2) $-5 + 2$

_____ 3) $\frac{5}{4} \div 2$

_____ 4) $4 \times 3 - (12 \div 6)$

_____ 5) Factorise completely $8x + 12$.

_____ 6) $\frac{21}{13} - \frac{9}{13}$

_____ 7) 8.6×100

_____ 8) Calculate the mean for the values : 7, 6, 14.

_____ 9) Write $\frac{9}{5}$ as a mixed number.

_____ 10) If $m = 2$, evaluate $m^2 + 2m$.

_____ 11) What is the diameter of a circle with 15 cm radius?

_____ 12) $20 \div -4$.

_____ 13) Expand $a(a - 4)$

_____ 14) Write $\frac{13.7}{10}$ as a percentage.

_____ 15) $\frac{4^{18}}{4^{17}}$

_____ 16) A square has area 49 cm^2. Find its side length.

_____ 17) 5% of 120

_____ 18) If $3x + 7 = 13$, calculate x.

_____ 19) $\left(\frac{540}{\tan\theta}\right)^0$

_____ 20) Convert 5:30 pm to 24 hour time.

Queensland Association of Mathematics Teachers – Rockhampton Branch
Maths Teams Challenge 2020 – Year 9 & 10 Individual Questions

Student 4

Instructions : Calculators are not allowed. Write the answer to each question on the line provided.

_____ 1) Round 9.2386 to the nearest hundredth.

_____ 2) $-7 + 4$

_____ 3) $\frac{7}{6} \div 3$

_____ 4) $7 \times 2 - (20 \div 5)$

_____ 5) Factorise completely $10x + 15$.

_____ 6) $\frac{24}{19} - \frac{6}{19}$

_____ 7) 1.2×100

_____ 8) Calculate the mean for the values : 3, 2, 13.

_____ 9) Write $\frac{7}{2}$ as a mixed number.

_____ 10) If $p = 2$, evaluate $p^2 - 2p$.

_____ 11) What is the diameter of a circle with 16 cm radius?

_____ 12) $14 \div -7$.

_____ 13) Expand $m(m + 3)$

_____ 14) Write $\frac{14.8}{10}$ as a percentage.

_____ 15) $\frac{5^{20}}{5^{19}}$

_____ 16) A square has area 64 cm^2. Find its side length.

_____ 17) 5% of 140

_____ 18) If $5x + 2 = 22$, calculate x.

_____ 19) $\left(\frac{650}{\sin\theta}\right)^0$

_____ 20) Convert 8:30 pm to 24 hour time.

Queensland Association of Mathematics Teachers – Rockhampton Branch
Maths Teams Challenge 2020 – Year 9 & 10 Individual Questions

Student 5

Instructions : Calculators are not allowed. Write the answer to each question on the line provided.

_____ 1) Round 2.8396 to the nearest hundredth.

_____ 2) $-9 + 2$

_____ 3) $\frac{3}{2} \div 5$

_____ 4) $3 \times 5 - (18 \div 3)$

_____ 5) Factorise completely $12x + 18$.

_____ 6) $\frac{23}{17} - \frac{7}{17}$

_____ 7) 2.9×100

_____ 8) Calculate the mean for the values : 8, 4, 12.

_____ 9) Write $\frac{13}{6}$ as a mixed number.

_____ 10) If $x = 3$, evaluate $x^2 - 2x$.

_____ 11) What is the diameter of a circle with 17 cm radius?

_____ 12) $-12 \div 3$.

_____ 13) Expand $b(b - 6)$

_____ 14) Write $\frac{15.9}{10}$ as a percentage.

_____ 15) $\frac{6^{17}}{6^{16}}$

_____ 16) A square has area 81 cm^2. Find its side length.

_____ 17) 5% of 200

_____ 18) If $4x + 1 = 17$, calculate x.

_____ 19) $\left(\frac{340}{\cos\theta}\right)^0$

_____ 20) Convert 7:30 pm to 24 hour time.

Queensland Association of Mathematics Teachers – Rockhampton Branch
Maths Teams Challenge 2020 – Year 9 & 10 Individual Questions

Student 1 Answers

1) 2.97
2) -5
3) $\frac{9}{16}$
4) 10
5) $2(2x+3)$
6) $\frac{8}{9}$
7) 570
8) 7
9) $3\frac{1}{3}$
10) 21
11) 26
12) -3
13) k^2+2k
14) 126
15) 2
16) 6
17) 8
18) 4
19) 1
20) 17:30

Student 2 Answers

1) 3.27
2) -1
3) $\frac{4}{15}$
4) 8
5) $3(2x+3)$
6) $\frac{14}{15}$
7) 740
8) 10
9) $3\frac{1}{4}$
10) 4
11) 28
12) -2
13) n^2+5n
14) 115
15) 3
16) 5
17) 9
18) 2
19) 1
20) 16:30

Student 3 Answers

1) 8.63
2) -3
3) $\frac{5}{8}$
4) 10
5) $4(2x+3)$
6) $\frac{12}{13}$
7) 860
8) 9
9) $1\frac{4}{5}$
10) 8
11) 30
12) -5
13) a^2-4a
14) 137
15) 4
16) 7
17) 6
18) 2
19) 1
20) 17:30

Queensland Association of Mathematics Teachers – Rockhampton Branch
Maths Teams Challenge 2020 – Year 9 & 10 Individual Questions

Student 4 Answers

1) 9.24
2) -3
3) $\frac{7}{18}$
4) 10
5) $5(2x+3)$
6) $\frac{18}{19}$
7) 120
8) 6
9) $3\frac{1}{2}$
10) 0
11) 32
12) -2
13) m^2+3m
14) 148
15) 5
16) 8
17) 7
18) 4
19) 1
20) 20:30

Student 5 Answers

1) 2.84
2) -7
3) $\frac{3}{10}$
4) 11
5) $16(2x+3)$
6) $\frac{16}{17}$
7) 290
8) 8
9) $2\frac{1}{6}$
10) 3
11) 34
12) -4
13) b^2-6b
14) 159
15) 6
16) 9
17) 5
18) 4
19) 1
20) 19:30

Scores

Year _____

School _____

Team _____

Student 1	
Student 2	
Student 3	
Student 4	
Student 5	
TOTAL	

out of 100

Queensland Association of Mathematics Teachers - Rockhampton Branch
Maths Teams Challenge 2020 - Year 9 & 10 Relay Questions

1) Of the 32 students in the class, 87.5% went camping over the Easter long weekend. Find the number of students that did not go camping.

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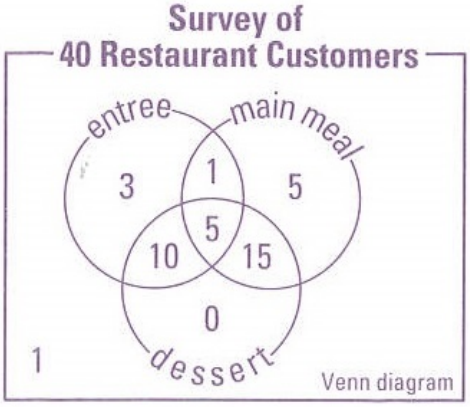
Maths Teams Challenge 2020 - Year 9 & 10 Relay Questions

2) Find the probability that a customer selected at random had a main meal and dessert but no entree. Give your answer as a fraction in lowest terms.



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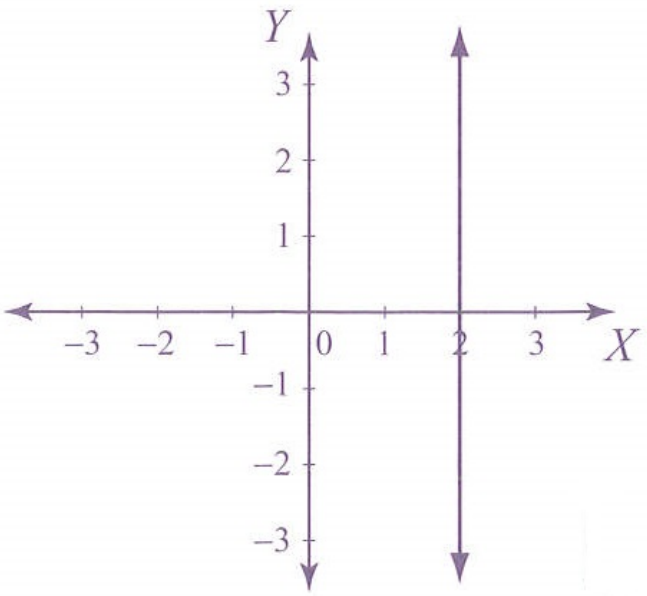
Maths Teams Challenge 2020 - Year 9 & 10 Relay Questions

3) State the equation of the straight line graphed.



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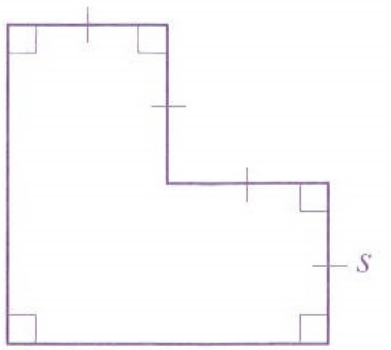
Maths Teams Challenge 2020 - Year 9 & 10 Relay Questions

4) Write the formula to calculate the perimeter P of the polygon pictured.



5) Find the time elapsed, in hours and minutes, from 12:30 pm one day until 06:20 am the next day.

6) A flag pole is 16 metres high. Support wires are to be attached three quarters of the way up the pole and attached to the ground 9 metres from the base. How long must each support wire be?

7) A farmer pumps 288,000 L of water from the river each day to irrigate his land. If the pump runs 24 hours a day, find how many litres of water are being pumped every minute.

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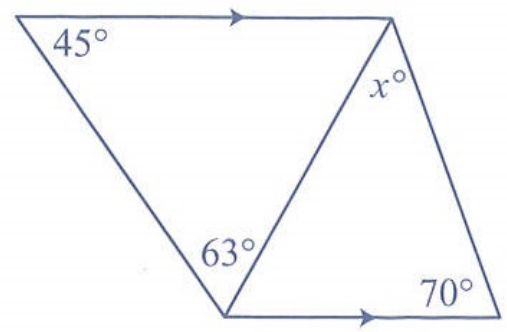
Maths Teams Challenge 2020 - Year 9 & 10 Relay Questions

8) Find the value of x^o.



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Maths Teams Challenge 2020 - Year 9 & 10 Relay Questions

9) Express the recurring decimal $0.\dot{1}\dot{5}$ as a fraction in simplest form.

10) If $0 < x < 1$, which of the following is the largest?

(a) $\frac{1}{x^2}$

(b) $\frac{1}{x}$

(c) x

(d) x^2

(e) x^3

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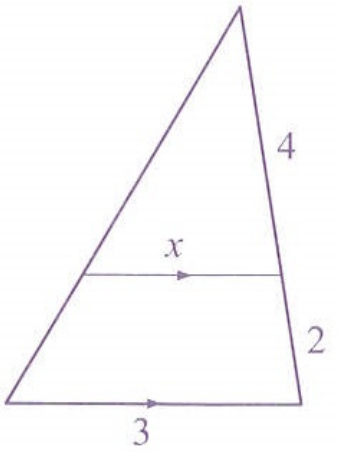
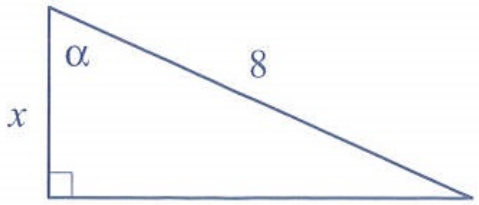
Maths Teams Challenge 2020 - Year 9 & 10 Relay Questions

11) Find the value of x.



12) Given $\cos\alpha = 0.45$, find the value of x.



13) Give the next two values in the following pattern.

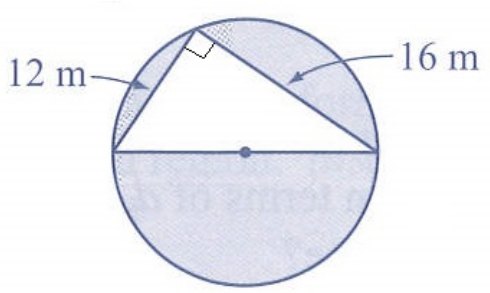
$$0, 3, 3, 6, 9, 15, ...$$

14) A square based pyramid of base 3 cm by 3 cm is made from 18 cm^3 of clay. Find the height of the pyramid.

(Hint : The formula for the volume of a pyramid is $V = \frac{1}{3}A_b h$ where A_b is the area of the base and h is the height.)

15) Harrison has four litres of ocean water which has a concentration of 5% salt. How many litres of pure water must Harrison add to this to reduce the concentration of salt to 2%?

16) Using $\pi = 3.14$, find the area of the shaded region around the right triangle pictured.



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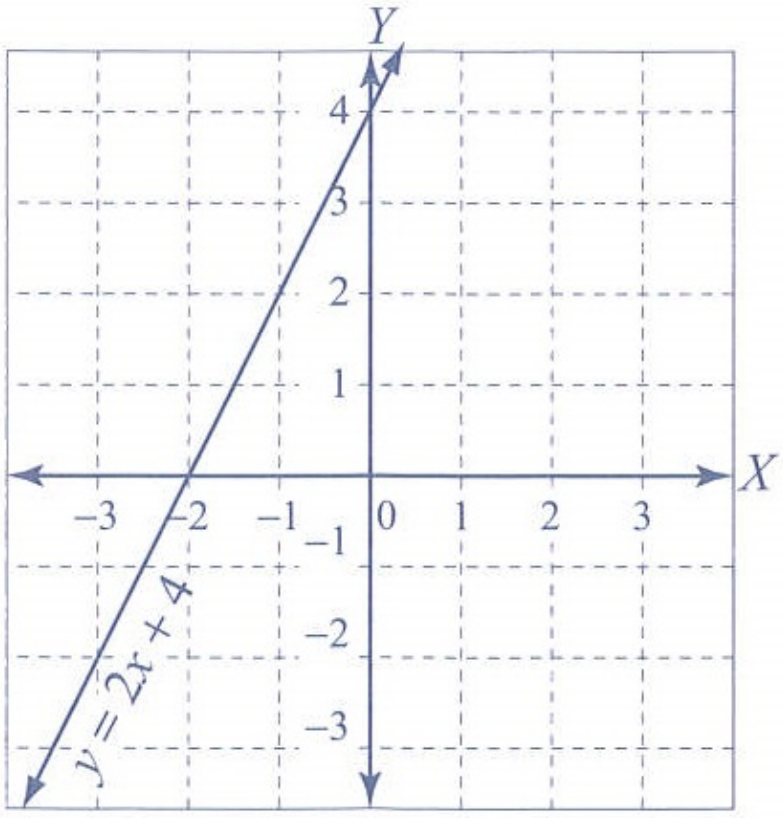
Maths Teams Challenge 2020 - Year 9 & 10 Relay Questions

17) Solve $y = 2x + 4$ and $y = 1 - x$ simultaneously by drawing the second line and stating the coordinates (x, y) of the point of intersection.



18) A zebra can run at a speed up to 18 metres per second, while a red deer can run at a maximum speed of 78 kilometres per hour. Give the speed of the animal that can run the fastest in metres per minute.

19) Jenny has \$30. Louise has 50% more than Jenny. Alex has twice as much as Louise. Express the amount of money owned by Jenny, Louise, and Alex as a ratio in simplest form.

20) If $x^a = 2$ and $x^b = 3$, find the value of x^{2a+3b}.

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Maths Teams Challenge 2020 - Year 9 & 10 Relay Questions

21) An empty rectangular fish tank measuring 120 cm long and 50 cm wide is filled with 240 litres of water. What is the depth of the water in the fish tank?

22) When a fair six-sided die is tossed on a table top, the bottom face cannot be seen. What is the probability that the sum of the numbers on the five faces that can be seen is divisible by number that cannot be seen? Answer as a fraction in simplest form.

23) There are 90 different two digit numbers. How many of these do not contain any of the digits 1, 2, 3, or 4?

24) The surface area of a cube is 54 cm^3. Find the length of its sides.

Queensland Association of Mathematics Teachers - Rockhampton Branch
Maths Teams Challenge 2020 - Year 9 & 10 Relay Questions

25) If the mean of the distribution below is 72.5, complete the table with the frequency of a score of 75.

score	70	71	72	73	74	75
frequency	1	4	10	4	1	?

Queensland Association of Mathematics Teachers – Rockhampton Branch
Year 9 & 10 Maths Teams Challenge 2020 – Relay Questions Answers

Year Level : 9 or 10 (circle one)

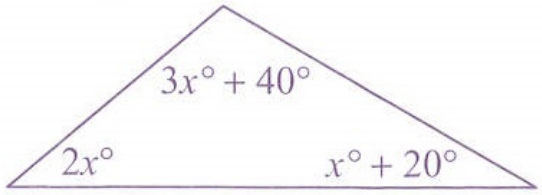
School : _____ Team Number : _____

Question	**Relay Answers**	**Attempt**	**Score**
R25	4	1 2 3 P	8 6 4 0
R24	3 cm	1 2 3 P	8 6 4 0
R23	30	1 2 3 P	8 6 4 0
R22	$\frac{1}{3}$	1 2 3 P	8 6 4 0
R21	40 cm	1 2 3 P	8 6 4 0
R20	108	1 2 3 P	8 6 4 0
R19	2 : 3 : 6	1 2 3 P	8 6 4 0
R18	1300 m/min	1 2 3 P	8 6 4 0
R17	$(-1, 2)$	1 2 3 P	8 6 4 0
R16	218 m^2	1 2 3 P	8 6 4 0
R15	6 litres	1 2 3 P	8 6 4 0
R14	6 cm	1 2 3 P	8 6 4 0
R13	24, 39	1 2 3 P	8 6 4 0
R12	3.6	1 2 3 P	8 6 4 0
R11	2	1 2 3 P	8 6 4 0
R10	(a)	1 2 3 P	8 6 4 0
R9	$\frac{5}{33}$	1 2 3 P	8 6 4 0
R8	38^o	1 2 3 P	8 6 4 0
R7	200 litres	1 2 3 P	8 6 4 0
R6	15 metres	1 2 3 P	8 6 4 0
R5	17 hours 50 minutes	1 2 3 P	8 6 4 0
R4	$P = 8s$	1 2 3 P	8 6 4 0
R3	$x = 2$	1 2 3 P	8 6 4 0
R2	$\frac{3}{8}$	1 2 3 P	8 6 4 0
R1	4 students	1 2 3 P	8 6 4 0
Total			

out of 200

Queensland Association of Mathematics Teachers – Rockhampton Branch
Maths Teams Challenge 2020 – Year 9 & 10 Team Questions

1) Find the value of the largest angle in the triangle.
(10 points)



2) How much time is saved by driving 10 km at 100 km/h instead of 60 km/h?
(10 points)

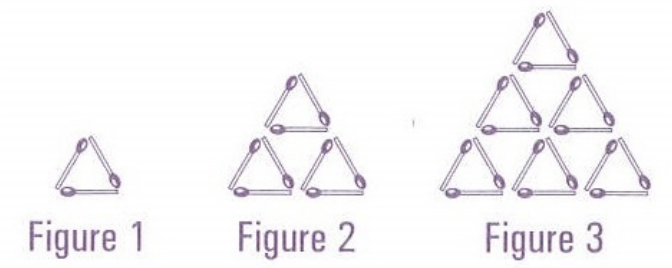
3) Ellie has $\frac{3}{5}$ of the amount of money Grace has. How much money does Ellie have if Grace has \$6 more than Ellie?
(10 points)

4) Two rockets fly directly towards each other from two different places 1317 kilometres apart. One flies at a speed of 9000 kilometres per hour and the other at 21,000 kilometres per hour. What is the distance between the rockets one minute before they collide?
(20 points)

5) If it takes 8 builders 6 days to build 3 barns, how long would it take 12 builders to build 6 barns, working at the same rate?
(20 points)

6) If A is 40% of B, express B as a percentage of A.
(20 points)

7) A pattern of triangles is made from matches, as shown. To make the first triangle requires 3 matches, the second requires 9 matches. How many matches are required for the tenth figure in this pattern?
(20 points)

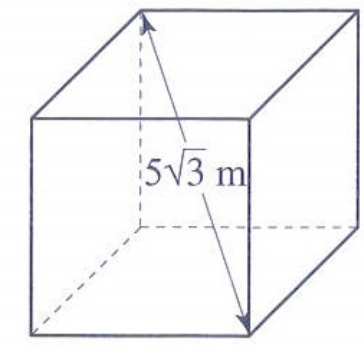


8) Wednesday at 12:00 in Sydney occurs at 18:00 on Tuesday in San Francisco. What day and time is it in Sydney if it is 01:40 on Friday in San Francisco?
(30 points)

9) Solve for x.
(30 points)

$$(x+1)+(x+2)+(x+3)+\ldots+(x+99)+(x+100)=15,050$$

10) Find the total surface area of the cube.
(30 points)



Queensland Association of Mathematics Teachers – Rockhampton Branch
Year 9 & 10 Maths Teams Challenge 2020 – Team Questions Answers Sheet

Year Level : 9 or 10 (circle one)

School : _____ Team Number : _____

Question	Answers	Score	Points
T1			10
T2			10
T3			10
T4			20
T5			20
T6			20
T7			20
T8			30
T9			30
T10			30
Total			

out of 200

Estimation Event Response : _____

Queensland Association of Mathematics Teachers − Rockhampton Branch
Year 9 & 10 Maths Teams Challenge 2020 − Team Questions Answers

Question	**Answers**	**Points**	
T1	100 degrees	10	
T2	4 minutes	10	
T3	\$9	10	
T4	500 kilometres	20	
T5	8 days	20	
T6	250%	20	
T7	165 matches	20	
T8	19:40 or 7:40 pm	30	
T9	$x = 100$	30	
T10	150 m^2	30	
Total		200	

Queensland Association of Mathematics Teachers – Rockhampton Branch
Maths Teams Challenge 2020 – Year 9 & 10 Shoot Out Questions

Round 1

1. Convert 21 centimetres into millimetres.
   210

2. State the first thing performed in the order of operations.
   brackets or parenthesis

3. In statistics, the average is otherwise known as . . .
   the mean

4. What is the tens digit in the number three thousand two hundred and ninety eight?
   9

5. How many degrees are in one revolution?
   360

6. What is the probability of rolling a 5 on a six-sided die?
   $\mathbf{\frac{1}{6}}$

7. Give an example of an obtuse angle.
   Any value between 90 and 180 degrees.

8. Reduce $\frac{16}{18}$ to a fraction in lowest terms.
   $\mathbf{\frac{8}{9}}$

9. How many seconds are in two and a half minutes?
   150

10. Compute $2^2 + 3^2$.
    13

11. Convert 18 kilograms to grams.
    18,000

12. List the first five positive multiples of 3.
    3, 6, 9, 12, 15

13. In 18.259, which digit is in the tenths place?
    2

14. Give an example of an acute angle.
    Any value between 0 and 90 degrees.

15. List all possible outcomes of rolling a fair die.
    1, 2, 3, 4, 5, or 6

16. The diameter of a circle is how many times the radius?
    2

17. List all the factors of 9.
    9, 3, 1

18. Which is smaller, one fifth or one twelfth?
    one twelfth

19. If one week has 7 days, how many weeks are in 56 days?
    8

20. Name the quadrilateral with all four sides the same length but no right angles.
    rhombus

Queensland Association of Mathematics Teachers – Rockhampton Branch
Maths Teams Challenge 2020 – Year 9 & 10 Shoot Out Questions

Round 2

1. How many hours are in one and a half days?
   36

2. Correctly spell the word denominator.
   denominator

3. True or False : Two is a prime number.
   true

4. A compass and protractor are common mathematical tools found in a kent set. Which is the flat plastic semicircle?
   protractor

5. How many hours have elapsed starting from 9:30 am and finishing at 6:30 pm on the same day.
   9

6. Give an example of a reflex angle.
   Any value between 180 and 360 degrees.

7. What is the probability of rolling an even number of a six-sided die?
   $\mathbf{\frac{1}{2}}$

8. The perimeter of a circle is otherwise known as . . .
   circumference

9. In 24 hour time, what is 2 pm?
   14:00

10. State the number that is opposite the 2 on a six sided die.
    5

11. A circular prism is more commonly known as . . .
    a cylinder

12. Name the type of triangle that has no sides the same length?
    scalene

13. Give the answer to 19 squared.
    361

14. Multiply three fifths by one fourth.
    three twentieths

15. The total sum of all interior angles in a quadrilateral is equal to . . .
    360

16. As a roman numeral, V is equivalent to what value?
    5

17. The line in the middle of a fraction is called . . .
    the vinculum

18. One decade has how many years?
    10

19. Compute $\sqrt{25} + \sqrt{81}$.
    14

20. Name the side of the right triangle which is always opposite the right angle.
    the hypotenuse

Queensland Association of Mathematics Teachers

Rockhampton Branch

Maths Teams Challenge

_____

name

from _____

school

participated at this competition in Year _____

_____

date

Queensland Association of Mathematics Teachers

Rockhampton Branch

This is to certify that

_____

supervised at the Year 9 & 10 Maths Teams Challenge incorporating engaging mathematical activities.

AITSL Standard 3 – Plan for and implement effective teaching and learning
AITSL Standard 7.4 – Engage with professional teaching networks and broader communities

2.5 hours of professional development

_____
date

Suella Lye
Suella Lye
President