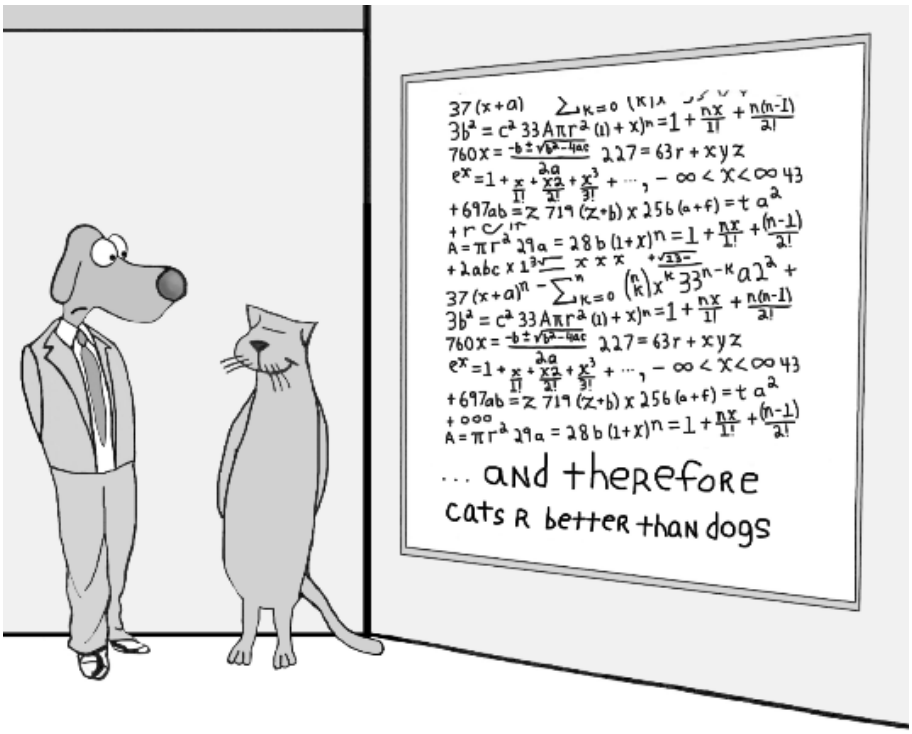
Year 8 Maths General Numeracy Worksheet

20 questions covering a range of numeracy skills from the national curriculum for Year 8.



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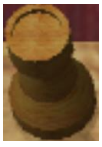
Questions

1. In Chess an opponent's piece is captured by moving onto the same square.

If Black moves from d3 to a6 which piece is captured?

a) 

b) 

c) 

d) 

Answer: _____

2. Jason's clock shows 24-hour time.

   What time is it in 12-hour time when his clock shows:

Answer: _____

3. Clocks at London Airport at 12 noon showed the local times in New York, London, Tokyo and Canberra.

   What time will it be in Canberra when it is 6:30 pm Tuesday in New York?

   a) 12:30 pm Wednesday
   b) 12:30 pm Tuesday
   c) 12:30 am Wednesday
   d) 12:30 am Tuesday

Answer: _____

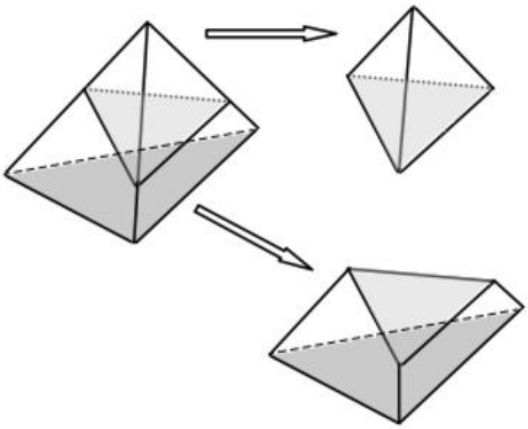
4. Matt slices a hard-boiled egg into five slices.

What shape is the middle slice most like?

a) prism
b) cone
c) cylinder
d) sphere

Answer: _____

5. A triangular pyramid is cut into two polyhedra, (solids with flat faces and straight edges).



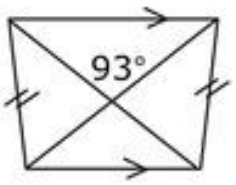
How many faces, edges and vertices does the bottom piece have?

a) 6 faces 9 edges 4 vertices
b) 4 faces 9 edges 6 vertices
c) 6 faces 5 edges 9 vertices
d) 5 faces 9 edges 6 vertices

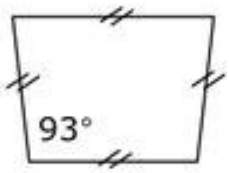
Answer: _____

6. These drawings are approximate, not accurate, meaning that the information is accurate but the shapes are not. Using only the information marked on the figures, identify the rhombus.

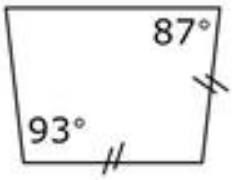
a)



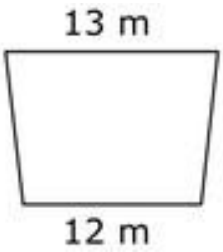
b)



c)



d)



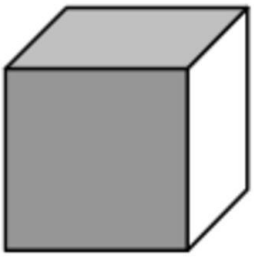
Answer: _____

7. Write, in Roman numerals, the sum of

   MCXCLIX and DCCCLI.

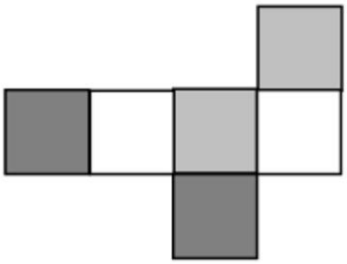
Answer: _____

8. The faces of a cube have been painted white, light grey and dark grey. No two faces sharing an edge are the same colour.

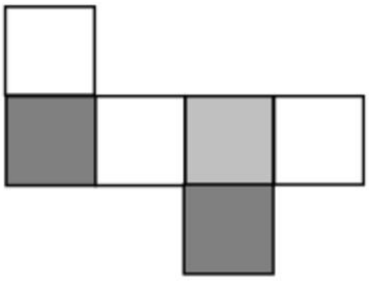


Which is the net of this cube?

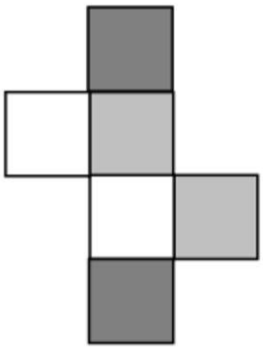
a)



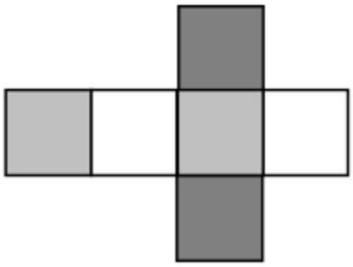
b)



c)

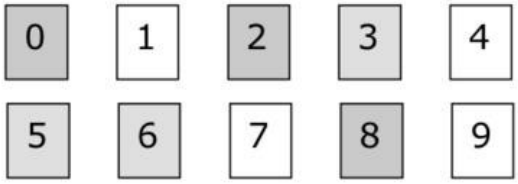


d)

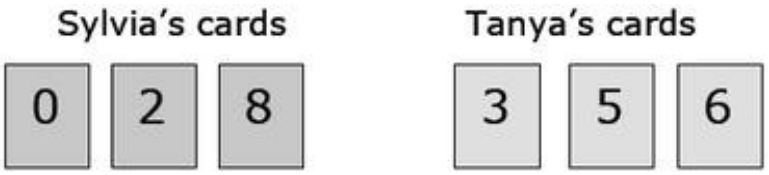


Answer: _____

9. Sylvia and Tanya play a game where they are dealt cards from the following deck:



They each have the three digit cards shown.



They are both dealt another digit card from the four remaining.

What is the probability that Tanya can make the bigger number?

a) 0.5

b) 0.75

c) 0.1

d) 0.25

Answer: _____

10. Rewrite the algebraic fraction:

$$\frac{24a^3b^2c^4}{2(ac)^3}$$

in the simplest form.

a) $\frac{3ab^2c^2}{2ac}$

b) $12ab^2c^2$

c) $12b^2c$

d) $3b^2c^2$

Answer: _____

11. Tom drank half of a 1 litre bottle of juice.

Molly drank all the juice in a 600mL bottle.

Which statement is true?

a) Tom drank 100mL more juice than Molly.
b) Molly drank 100mL more juice than Tom.
c) They both drank the same amount of juice.
d) Molly and Tom together drank 1 litre of juice

Answer: _____

12.

How many right angles does the minute hand of a clock turn through between 12 noon and 4:30 pm?

a) 18

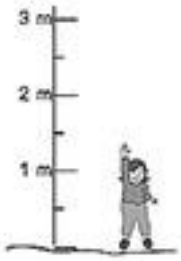
b) 9

c) 2

d) 36

Answer: _____

13.Jody is reaching as high as she can.



Approximately how high can Jody reach?

a) 16 metres

b) 14 centimetres

c) 140 centimetres

d) 1.6 metres

Answer: _____

14. Which digital clock is showing the same time as the 24-hour time of 22:45?

a) 

b) 

c) 

d) 

Answer: _____

15. Which fraction is the largest?

a) 17/24
b) 9/12
c) 2/3
d) 5/8

Answer: _____

16. Ruth uses the square button on her calculator and finds that $1.4142135^2 = 1.999999824$ and $1.4142136^2 = 2.000000106$

Which of the following statements is true?

a) $1.4142135 \leq \sqrt{2} \leq 1.4142136$

b) $\sqrt{2} = 1.4142136^2 - 0.000000106$

c) $1.4142135 < \sqrt{2} < 1.4142136$

d) $\sqrt{2} = (1.4142136 + 1.4142135) \div 2$

Answer: _____

17. Which of these points is halfway between the points (1, 4) and (5, 6)?

a) (2, 1)

b) (5, 3)

c) (1, 2)

d) (3, 5)

Answer: _____

18. Which digit is **incorrect** in this subtraction?

$$\begin{array}{r} 907 \\ -\ 165 \\ \hline 842 \end{array}$$

a) 8

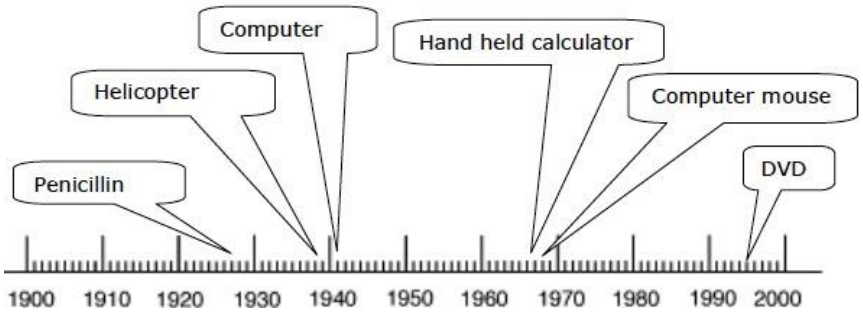
b) 2

c) 0

d) 4

Answer: _____

19. The timeline gives the years for some inventions in the 20th Century.



Which of these first came into use in the 7th decade of the 20th Century?

a) DVD

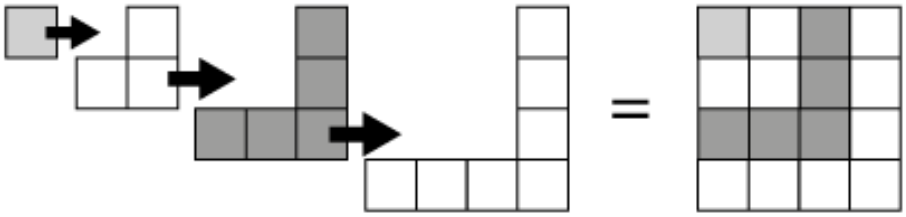
b) Penicillin

c) Helicopter

d) Hand held calculator

Answer: _____

20. Megan counts the boxes in the L-shaped regions and puts them together to make a larger square.



1 + 3 + 5 + 7 = 16

What conclusion should Megan come to?

a) $1 + 3 + 5 + \ldots + 20 = 10^2$
b) $1 + 3 + 5 + 7 + 9 + 13 = 6^2$
c) $1 + 3 + 5 + \ldots + 39 = 38^2$
d) $1 + 3 + 5 + 7 + 9 + 11 + 13 = 7^2$

Answer: _____

The Answers.

Hey! No peeking until you've finished…

Question 1

Answer: C

The diagram below shows the black piece at d3. It moves to a6. The piece that is captured is circled in blue:

So, the piece that is captured is:

Question 2

Answer: C

Digital clocks displaying 24 hour time show midnight, which is 12:00am as 00:00.

Then, the hours are counted up all the way to 23:00 which is the same as 11:00pm at night.

The minutes are displayed in the same way as they are on a 12 hour am/pm digital clock.

"am" and "pm" are NOT shown on a 24 hour clock because we can tell from the number of hours whether the time is before or after midday.

So, 01:25 is the same as 1:25am (very early in the morning).

Question 3

Answer: A

When the Canberra clock is showing 11.00 pm Monday, the New York clock is showing 5.00 am Monday.

We need to work out the difference between these two times.

From 5.00 am to 12.00 pm (midday) is 7 hours, then there are 11 hours from 12.00 pm to 11.00 pm, making a total difference of 18 hours. So, New York is 18 hours "behind" Canberra.

To work out the time in Canberra when it is 6.30 pm Tuesday in New York we will therefore need to add 18 hours to that time. It's probably easiest to break the 18 hours into 12 hours and 6 hours.

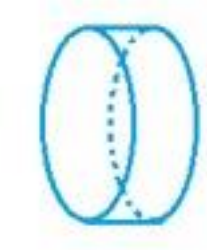
Twelve hours after 6.30 pm Tuesday is 6.30 am WEDNESDAY, and a further 6 hours after that, it will be**12.30 pm Wednesday**.

Question 4

Answer: C

Imagine cutting the egg along the blue lines as shown below.

This will leave a section that will look something like this:

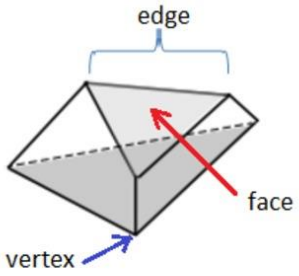


This solid shape has two circular ends (bases), joined by a curved surface, so it's a cylinder.

Question 5

Answer: D

Look carefully at the "new" solid and methodically count the faces (sides), edges and vertices (corners).



We find that the solid has:

5 faces

9 edges (3 around the top, 3 around the bottom, and 3 connecting the top and the bottom)

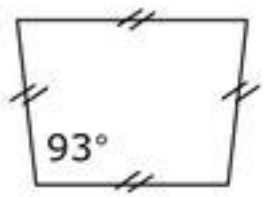
6 vertices (3 around the top and 3 around the bottom).

Question 6

Answer: B

A rhombus is an equilateral parallelogram. In other words, it is a four-sided shape that has four sides of equal length (also by definition, opposite sides are parallel). A square is a special case.

The correct shape is:



The angle of 93 degrees doesn't really matter - a rhombus can have any angle, provided the opposite angle (upper right angle in this case) is identical. The double lines on each side length tell us that each side is the same length - this is how we know it is a rhombus.

Question 7

Answer: MMC

We can convert these two numbers to our "normal" number system (Hindu-Arabic). It is useful to group the symbols that relate to the ones (units), tens, fifties, hundreds etc.

There are seven symbols used in Roman numerals:

I meaning 1

V meaning 5

X meaning 10

L meaning 50

C meaning100

D meaning 500

M meaning 1000

MCXCLIX can be broken up as follows:

MC XCL IX

MC stands for "100 after 1000", so that's 1 100

XCL stands for "10 before 150", so that's 140

IX stands for "1 before 10", so that's 9.

That makes the first of the two numbers:

1 100 + 140 + 9

= 1 249

DCCCLI can be broken up as:

DCCC L I

DCCC stands for "300 after 500", so that's 800

L is simply 50

I is simply 1.

So, this number is:

800 + 50 + 1

= 851.

Now we can do the addition:

1 249 + 851 = 2 100

Finally, we'll change that back to Roman numerals:

One thousand is M, so two thousand is MM, and one hundred is C, so:

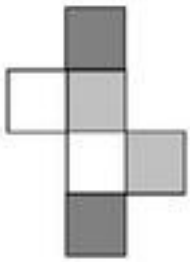
2 100 = MMC

Question 8

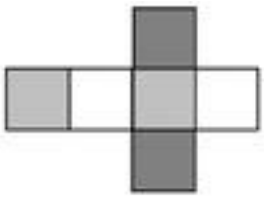
Answer: D

Imagine folding each net into a cube. Look at the faces that share edges to see if any two are the same colour.

For example:



In this net, notice that the two white faces will share an edge, as will the two light grey and the two dark grey faces.



In this one, we can see that the three colours alternate, and each colour will always share edges with different colours, so this is the corrrect answer.

Question 9

Answer: D

Both girls will be making 4 digit numbers, once they've drawn their fourth cards.

That means that Sylvia will be able to make numbers with 8 in the thousands column.

So, the only digit that Tanya draw that will allow her to make a number larger than Sylvia's is the 9, which she can place in the thousands place as well.

So, Tanya has a 1 in 4 or 0.25 probability of drawing a card that will ensure she can make a larger number.

Question 10

Answer: C

To simplify this expression, we need to identify factors shared by the numerator and the denominator.

First, though, it might be helpful to expand the $(ac)^3$ in the denominator:
$(ac)^3 = a^3c^3$

Now we can methodically simplify by finding common factors.

The 24 in the numerator and the 2 in the denominator have a common factor of 2, so that will leave 12 in the numerator (and 1 in the denominator) for the actual numbers.

The a^3 in the numerator cancels the a^3 in the denominator.
The b^2 in the numerator will remain the same as there are no factors of b in the denominator.
In the numerator, we have c^4 and in the denominator we have c^3 . This will leave one factor of c in the numerator:

$$\frac{24a^3b^2c^4}{2a^3c^3} = 12b^2c$$

Question 11

Answer: B

Tom drank half of the 1 L bottle of juice.

There are 1000 mL in 1 L, so half of that is:

1000 ÷ 2 = 500 mL

Now, compare that to the amount of juice Molly drank, which was 600 mL.

To find the difference, do the subtraction:

600 mL - 500 mL = 100 mL

So, Molly drank 100 mL MORE than Tom.

Question 12

Answer: A

From 12.00 pm (noon) to 4.30pm is a period of 4 and 1/2 hours.

In that time, the minute hand moves around the clock (from the 12 back to the 12) once in every hour (so that's 4 full turns) and from the 12 to the 6 (half a full circle) from 4.00pm to 4.30pm.

There are 360 degrees in a full circle, and a right angle is 90 degrees, which is 1/4 of 360.

So, in each full turn the minute hand will move through 4 right angles: from the 12 to the 3, from the 3 to the 6, from the 6 to the 9 and from the 9 to the 12.

That means in 4 full turns, it will move through 16 right angles, and there will be a further two right angles from 4.00pm to 4.30pm (half a circle; from the 12 to the 3 and from the 3 to the 6). That makes a total of 18 right angles.

Question 13

Answer: C

Jody is reaching almost as high as the mark half-way between 1m and 2m.

Half-way between the 1m and 2m mark would equal a height of 1.5m.

Therefore, Jody is reaching to a height just under the 1.5m mark, probably around 1.4m.

There are 100cm in 1 m:

1.4 m = 140 cm

Jody is reaching to a height of approximately 140cm.

Question 14

Answer: C

Remember that in "24 hour" time, the hours AFTER 12.00pm are written as the "pm" hours plus 12.

In other words, rather than going from 12.00pm (midday) to 1.00pm, we go from 12:00 to 13:00.

The minutes on a 24 hour digital clock are written in the same way as they are on a "normal" 12 hour digital clock.

So, when we see a time where the hours are greater than 12, we know it's written in 24 hour time and we know the time is after midday, so it's "pm".

Because we ADD 12 hours to change to 24 hour time, to change back, we need to SUBTRACT 12 hours.

So, 22:45 will be shown as **10:45pm** on a "normal" 12 hour digital clock.

Question 15

Answer: B

To compare the fractions, we need to change them to equivalent fractions over the same denominator.

We need a common multiple of the 4 denominators: 3, 8, 24 and 12.

What is the smallest number that each of these go into evenly? This is 24 so we need to change three of the fractions into 24ths.

To make equivalent fractions, we need to multiply the numerator and denominator by the same factor, so we have:

$^{2}/_{3}$ x $^{8}/_{8}$ = $^{16}/_{24}$
$^{5}/_{8}$ x $^{3}/_{3}$ = $^{15}/_{24}$
$^{9}/_{12}$ x $^{2}/_{2}$ = $^{18}/_{24}$
Our other fraction was already in 24ths: $^{17}/_{24}$, so the largest of the four fractions is $^{18}/_{24}$ or $\mathbf{^{9}/_{12}}$.

Question 16

Answer: C

On your calculator, find the square root of 2.

Your calculator will display: 1.414213562. This is a bit more than Ruth's first answer, and a bit less than her second answer, so we know that the square root of 2 falls between the two numbers. We can write this as:

1.4142135 < √2 < 1.4142136

Root 2 is not equal to either of the two numbers, and it doesn't fall exactly in the middle.

Question 17

Answer: D

The mid-point is given by the average of the x values and the y values, so the formula is:

$MP = \left({}^{(x1 + x2)}/_{2} , {}^{(y1 + y2)}/_{2} \right)$

$= \left({}^{(1 + 5)}/_{2} , {}^{(4 + 6)}/_{2} \right)$

$= (3 , 5)$

Question 18

Answer: A

Working through this subtraction, we start with

7 - 5 in the ones (units) column, which leaves 2.

Moving to the tens column, we have:

0 - 6, which we cannot do.

So, we re-group the 9 in the hundreds column, making it 8 hundreds and 10 tens.

These 10 tens are moved to the tens column so we now have:

10 - 6, leaving 4 in the tens column.

In the hundreds column, having regrouped, we now have:

8 - 1, which leaves 7 in the hundreds.

Hence, the 8 shown in the answer in the hundreds column is incorrect.

Question 19

Answer: D

The seventh decade of the 20th century was the "sixties": starting on 1 January 1961 and running through to 31 December 1970, so it was the hand-held calculator that came into use in that decade.

(Note: Some people consider that a decade starts with the "0" year; for example, 1 January 1960 to 31 December 1969; however, this would mean that there was a year zero at some point in the past, and of course, we start counting from 1.)

Question 20

Answer: D

Notice that we start with a square that is 1 x 1 (or 1 squared), using just the first odd number.

$1 = 1 \times 1 = 1^2$

When we slide that into the next shape, it combines the first two odd numbers (1 and 3), making 4, which is 2 x 2 or 2 squared.

$1 + 3 = 4 = 2 \times 2 = 2^2$

Then, with the first 3 odd numbers (1, 3 and 5) we have a total of 9 squares (1 + 3 + 5), which is 3 x 3 or 3 squared.

$1 + 3 + 5 = 9 = 3 \times 3 = 3^2$

The fourth term in the pattern uses the first 4 odd numbers (1, 3, 5 and 7), which add to 16, which is 4 x 4 or 4 squared.

$1 + 3 + 5 + 7 = 16 = 4 \times 4 = 4^2$

So, we can deduce that the total number of small squares that make up the large square is the number of consecutive odd numbers that we had added, squared.

Hence, 1 + 3 + 5 + 7 + 9 + 11 + 13 (which are the first 7 odd numbers) will be equal to 7^2 .