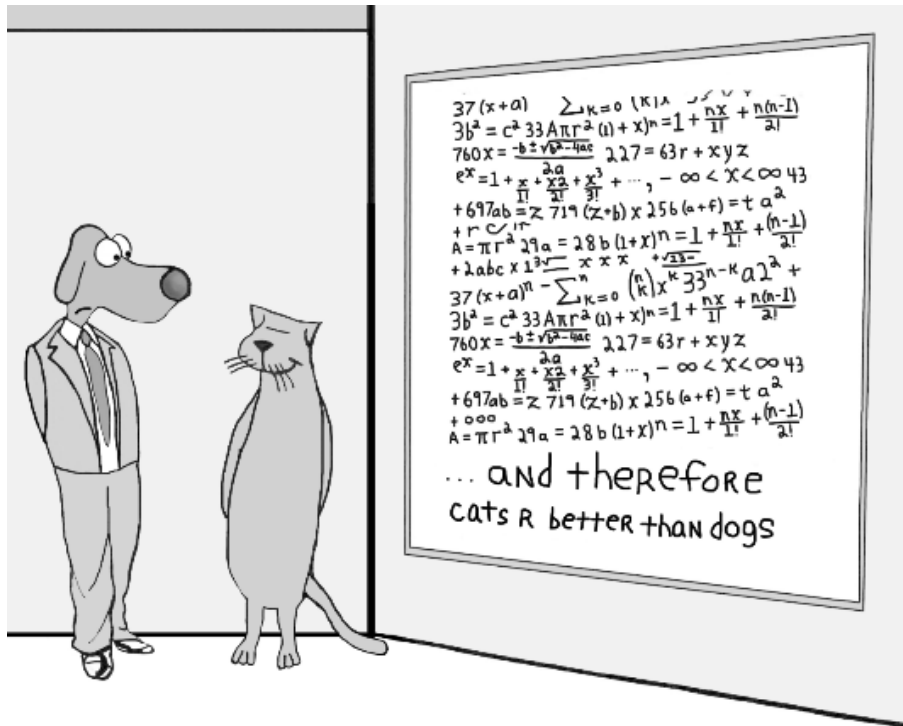


Year 8 Maths General Numeracy Worksheet 2

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



Remember you can connect to one of our awesome Maths tutors and they'll help you understand where you're going wrong.

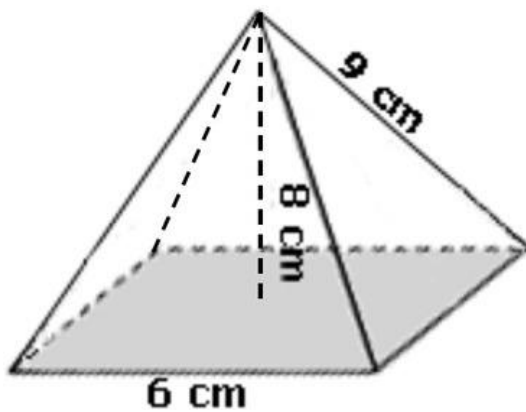
They're online 3pm-midnight AET, 6 days a week.

Homework help in a click: yourtutor.com.au



Questions

1. What is the volume of this square pyramid?



Give your answers in cm cubed.

Answer: _____

2. 800 students attend Yarrawonga College.

12% of them are in Year 12.

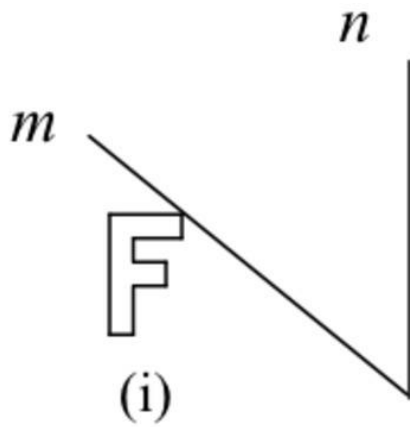
25% of Year 12 students study French.

Of all the students at Yarrawonga College, how many are **not** in the Year 12 French class?

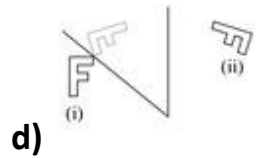
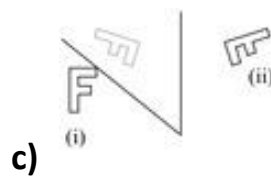
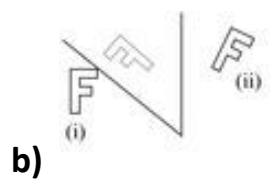
- a) 728
- b) 96
- c) 776
- d) 72

Answer: _____

3. Shape (i) is reflected in line m and then line n .



In which diagram is shape (ii) the image of shape (i)?



Answer: _____

4. A packet of jellybeans has more red than black jellybeans and just as many blue as white jellybeans.

There are no green jellybeans.

Sheila dips her hand in and takes a jellybean at random.

Which statement is true?

- a) Sheila has the same chance of picking a red as picking a black jellybean.
- b) Sheila will most likely pick a black jellybean.
- c) Sheila has the same chance of picking a blue as picking a white jellybean.
- d) Sheila is more likely to pick a green jellybean than a blue jellybean.

Answer: _____

5. Find three **consecutive integers** whose sum and product are both zero.

- a) $-1, 0, 1$
- b) $-2, 0, 2$
- c) $0, 0, 0$
- d) $1, 0, 1$

Answer: _____

6. There are 2 egg sandwiches, 3 chicken sandwiches, 4 cheese sandwiches and 1 salad sandwich on a plate.

Keith takes a sandwich at random.

Which filling is he most likely to have taken?

- a) chicken
- b) cheese
- c) egg
- d) egg salad

Answer: _____

7. Find the value of x when:

$$\frac{2x + 3}{5} + \frac{2 - 4x}{3} = \frac{1}{3}$$

- a) 2
- b) -2
- c) -1
- d) 1

Answer: _____

8. Which term is like x^2 ?

- a) $3xy^2$
- b) $3x^2y$
- c) $5x^2y^2$
- d) $5x^3 \div x$

Answer: _____

9. Ellie worked out the temperature of the day by counting 31 cricket chirps in 15 seconds.

Ellie used a formula for the Temperature:

$$\frac{5 \times (\text{number of chirps in 15 seconds}) + 25}{9} \text{ } ^\circ\text{C}$$

What was the temperature?

- a) 30°C
- b) 20°C
- c) 11°C
- d) 15°C

Answer: _____

10. In angle measurement, one degree = 60 minutes ($1^\circ = 60'$).
One minute = 60 seconds ($1' = 60''$).

Find the button on your calculator that changes angles in decimals of degrees to angles in degrees, minutes and seconds. You may have to use the Shift key.



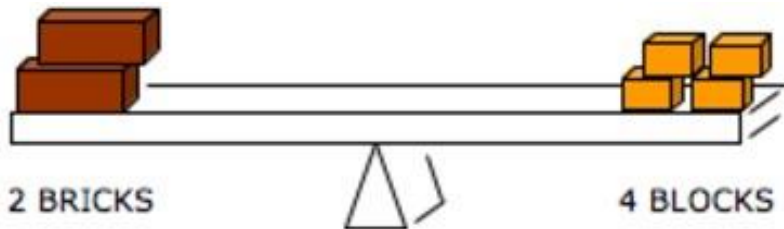
This button may be:

Write 39.805° in degrees, minutes and seconds.

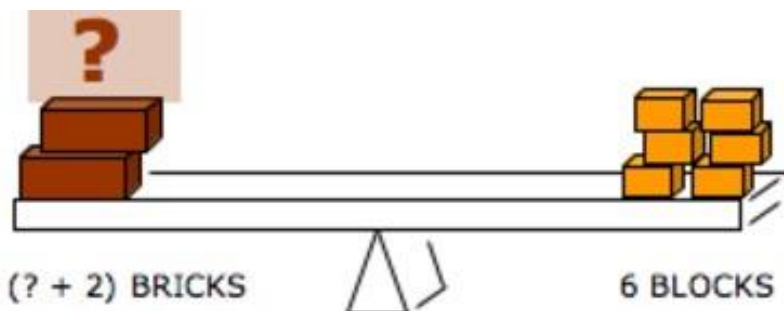
- a) $39^\circ 8' 05''$
- b) $39^\circ 80' 5''$
- c) $39^\circ 18' 48''$
- d) $39^\circ 48' 18''$

Answer: _____

11. Two bricks balance four wooden blocks.



How many **extra** bricks will be needed to balance 6 wooden blocks?



- a) 2 bricks
- b) half a brick
- c) 3 bricks
- d) 1 brick

Answer: _____

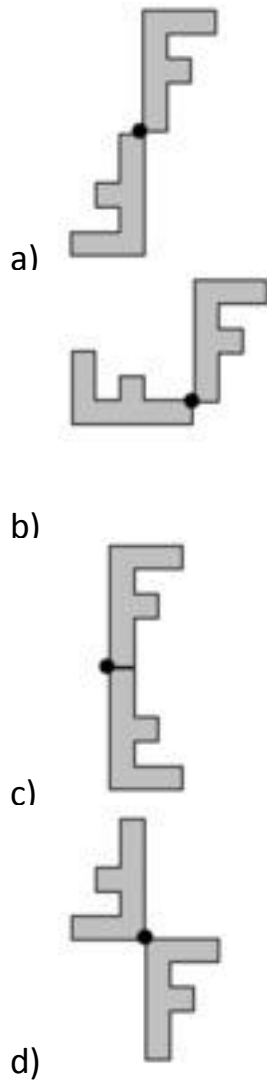
12. A job is advertised with a salary from \$40k to \$55k per annum.
Ms Habid applies for the job.

Which yearly salary might she expect?

- a) \$47 500
- b) \$410 000
- c) \$5400
- d) \$39 125

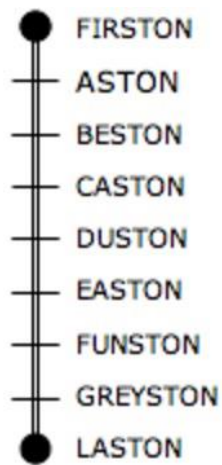
Answer: _____

13. Which diagram shows the letter **F** rotated through 180° about its bottom left corner?



Answer: _____

14. A train runs on a straight track from Firston to Laston through equally spaced stations.

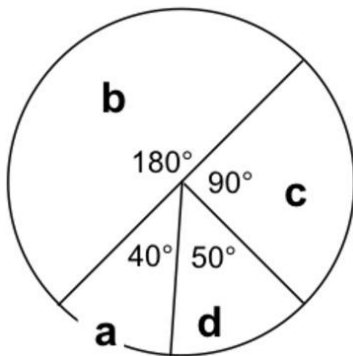


Which station is three-quarters of the way from Firston to Laston?

- a) FUNSTON
- b) CASTON
- c) DUSTON
- d) EASTON

Answer: _____

15.



Which part of the circle is a quadrant?

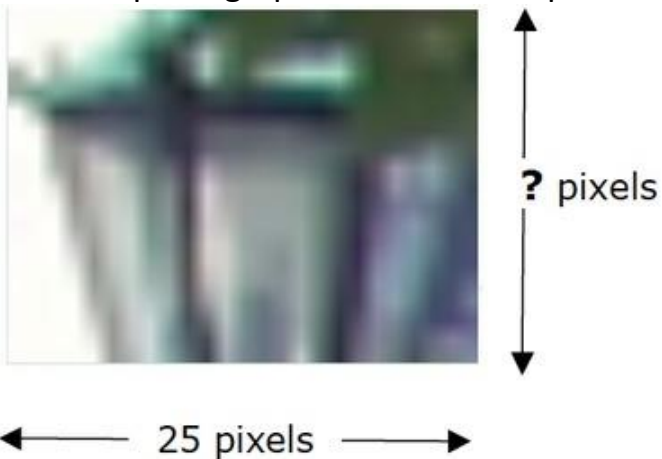
- a) c
- b) b
- c) d
- d) a

Answer: _____

16.

A **pixel** is a very small square.

This computer graphic contains 500 pixels.



How many pixels high is the graphic?

Answer: _____

17.

Gravity on the Moon is one-sixth of gravity on Earth.

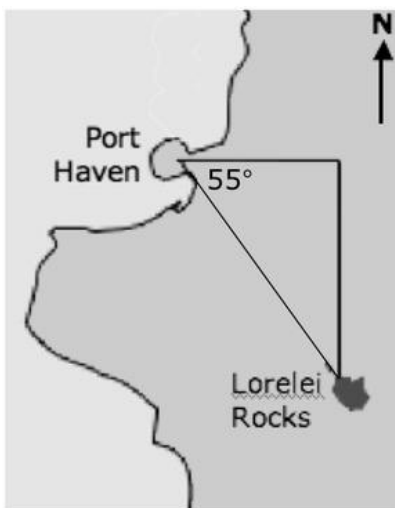
On the Moon an astronaut finds that a moon rock is balanced by **500 gm + 20 gm + 20 gm** standard masses.

What would the mass of the rock be on Earth?

- a) 90 g because the force of gravity is different on the Moon.
- b) 540 gm, because a balance compares equal masses not weights.
- c) 3.24 kg because gravity is 6 times stronger on Earth.
- d) It is impossible to say because the Moon is a long way from Earth.

Answer: _____

18.



What is the bearing of Lorelei Rocks from Port Haven?

- a) N55°W
- b) N35°W
- c) S35°E
- d) S55°E

Answer: _____

19. The table shows the Bell Times for morning school lessons.

Bell Times	Lessons and Breaks
8:55	Assembly
9:10	English
9:50	Maths
10:20	History
11:00	Recess
11:15	Science
12:25	Science
12:05	Lunch

George was 1 hour and 15 minutes late for school.

Which lesson was in progress when George arrived?

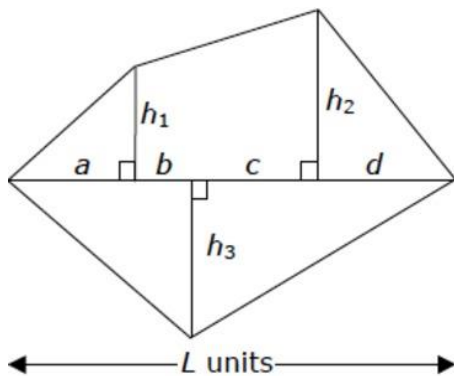
- a) Maths
- b) History
- c) Science
- d) English

Answer: _____

20. An irregular pentagon has been broken up into four triangles and a trapezium.

The area of the pentagon, A sq. units, is the sum of these five areas.

The length of the diagonal is L units.



Which is the **correct** expression for A ?

- a) $A = L(h_1 + h_2 + h_3)/2$
- b) $A = \frac{1}{2}\{ah_1 + (b + c)(h_1 + h_2) + dh_2 + (a + b + c + d)h_3\}$
- c) $A = (1 + 2 + 3)Lh/2$
- d) $A = L(h_1 + h_2 + h_3)$

Answer: _____

The Answers.

Hey! No peeking until you've finished...



Question 1

Answer: 96 cubic cm

Identify the information you have been given and what you are asked to find:

Square of side $s = 6\text{cm}$

Perpendicular height $h = 8\text{cm}$

Diagonal length $d = 9\text{cm}$

Find: volume, V

Identify an equation relating the variables:

The formula for volume of a pyramid is $V = (\frac{1}{3})Ah$, where A is the base area of the pyramid and h is the perpendicular height.

Solve:

Since this is a square, $A = 6 \times 6 = 36$ squared cm.

h is given in the diagram as 8 cm.

$$V = (\frac{1}{3})Ah = (\frac{1}{3}) \times 36 \times 8$$

$V = 96$ cubic cm

Note that the diagonal length $d = 9\text{cm}$ was irrelevant. We did not need it to answer the question.

Question 2

Answer: C

As 25% of the Year 12 students study French, and the Year 12s make up 12% of the total school population, that means that:

25% of 12% of 800 students ARE in the Year 12 French Class.

We can calculate this number as follows:

25% of 12% of 800

$$= 0.25 \times 0.12 \times 800$$

= 24 students in the Year 12 French Class.

So, of the total school population of 800 students, the number NOT in the Year 12 French class will be:

$$800 - 24$$

= 776 students.

Question 3

Answer: D

First of all imagine or draw how the "F" will look when it is reflected in the first line. The shape is "flipped" across the line. It will look like this:

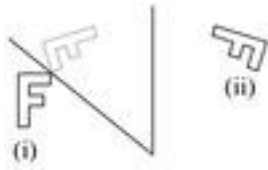


Now we need to reflect the "F" in the vertical line. It will be flipped again and will look like this:



To draw these reflections, it is sometimes helpful to choose an "anchor" point on the diagram (such as a corner of the figure) and start by working out where that will lie after the reflection is performed. Then, move around the figure taking other points and observe where these will be in relation to your anchor point. To be accurate, it's generally best to draw these on graph paper.

So, once we've reflected this figure twice according to the instructions, we can see that the correct answer is:



Question 4

Answer: C

Sheila will most likely pick a black jellybean: This is false. There are more red jellybeans than black ones, so it is more likely that we would pick a red one than a black one. We also have no information about how many red or black jellybeans there are compared to blue and white jelly beans.

Sheila is more likely to pick a green jellybean than a blue jelly bean: This is false. There are no green jellybeans.

Sheila has the same chance of picking a red as picking a black jellybean: This is false, because there are more red than black jellybeans. Therefore there is more chance of picking a red than a black.

Sheila has the same chance of picking a blue as picking a white jellybean: This is true, because there are just as many blue as white jellybeans.

Question 5

Answer: A

Consider each of the choices. Which answer contains consecutive integers?

1, 0, 1 are not consecutive. Also, the sum of these numbers is: $1 + 0 + 1 = 2$.

(The product of these numbers is zero because any number multiplied by zeros is zero.)

-2, 0, 2 are not consecutive integers either: there is a jump of 2 from -2 to 0 and from 0 to 2. (The sum and product of these integers IS equal to zero, but as they are not consecutive, this is not the correct answer.)

0, 0, 0: These are all the same, so are obviously not consecutive.

-1, 0, 1: These integers ARE consecutive. When we add them, we get:

$$\mathbf{-1 + 0 + 1 = 0}$$

When we multiply them, because one of them is zero, the answer is zero.

Question 6

Answer: B

At 4 out of 10, cheese is the most frequently occurring filling, so this has the highest probability of being chosen at random.

Question 7

Answer: D

We can think about this in a couple of ways, but in the end, the process is generally the same.

When adding fractions, we need them to have the same denominator, so we create equivalent fractions. We'll do that for all 3 fractions in this equation.

The lowest common multiple of 3 and 5 is 15, so we'll change the fractions to 15ths.

5 into 15 goes 3, so we need to multiply the first fraction by 3, in both the numerator and the denominator. 3 into 15 goes 5, so we'll multiply the numerator and denominator of the second fraction on the left side and the fraction on the right side by 3:

$$\frac{3(2x + 3)}{15} + \frac{5(2 - 4x)}{15} = \frac{5}{15}$$

Therefore:

$$3(2x + 3) + 5(2 - 4x) = 5 \text{ (equating the numerators or multiplying both sides by 15)}$$

$$6x + 9 + 10 - 20x = 5 \text{ (expanding the brackets)}$$

$$-14x + 19 = 5 \text{ (collecting like terms and simplifying)}$$

$$-14x = -14 \text{ (subtracting 19 from both sides)}$$

$$x = \frac{-14}{-14} \text{ (dividing both sides by -1)}$$

$$x = 1$$

Question 8

Answer: D

"Like" terms are amounts of the same "thing". We can add like terms together, whereas we cannot add unlike terms.

For example, we can add $3y + 4y$, and get $7y$. We cannot add $3y$ and $4y^2$: these are unlike terms.

None of the possible choices appear to be terms in x^2 . However, we can simplify this one:

$$5x^3 \div x$$

$$= \frac{5x^3}{x}$$

$$= 5x^2$$

So, this IS a term in x^2 and hence is "like" x^2 .

Question 9

Answer: B

Substitute the number of cricket chirps into the equation:

$$(5 \times 31 + 25)/9$$

Using the BOMDAS order of operations, we must do the multiplication first.

$$(155 + 25)/9$$

Because everything is divided by 9, we must simplify the numerator before dividing:

$$180/9$$

Temperature = 20°C

Question 10

Answer: D

Depending on your calculator, you will just need to key in the angle as a decimal, then press the button (possibly preceded by the shift key), and then hit "enter" or "=".

To check that you have used the calculator correctly, you can check your answer.

Ignore the whole degrees (39) because this part does not change.

Key in 0.805×60 . This will give you the decimal part in minutes. You should get 48.3.

So, the whole number of minutes is 48. Now, key in 0.3×60 . This will give the seconds. You should get 18.

So, in degrees, minutes and seconds, you have: 39.805 degrees = 39 degrees, 48 minutes, 18 seconds: **39° 48' 18"**

Question 11

Answer: D

Write the information from the diagram as an equation:

$$2 \text{ bricks} = 4 \text{ blocks}$$

To find how many blocks balance 1 brick, we would divide both sides of this equation by 2. (We must do the same thing to both sides of the "scales" to keep them balanced.)

$$2 \text{ bricks} \div 2 = 4 \text{ blocks} \div 2$$

Therefore, 1 brick = 2 blocks

Looking at the first diagram, if we were to put 2 more blocks on the right side of the scales (to make 6), then we would need to **add 1 brick** to the left side to keep it balanced.

Question 12

Answer: A

In metric measurement, "k" means one thousand, so 1 kg is 1000 grams, and 1km is 1000 metres.

When we use this symbol with money, it still means thousand, so Ms Habid could expect a salary between \$40 000 and \$55 000.

The answer that lies between these two numbers is \$47 500.

Question 13

Answer: A

Start by identifying the starting position and the shape's "bottom left corner".

This would be:



Now, keep that red dot still and turn the shape around this point. If we turn it clockwise, after 90 degrees it will look like this:



Rotate this through a further 90 degrees clockwise. It will now look like this:



Now, line up this image with the original one by superimposing the red dots. Your diagram will resemble this answer:



Question 14

Answer: A

From Firston to Laston, there are 8 equal sections of track, marked by the stations, so each station indicates $\frac{1}{8}$ of the track.

$\frac{3}{4}$ is the same as $\frac{6}{8}$, so we need to find the 6th station after Firston. This is Funston.

Funston is $\frac{3}{4}$ or $\frac{6}{8}$ of the way along the track.

Question 15

Answer: A

If we add all the angles on the diagram, we find that they come to a total of 360 degrees. (There are always 360 degrees in a circle.) As a quadrant is one quarter of a circle, we need to find $\frac{1}{4}$ of 360, which is:

$$360 \div 4 = 90 \text{ degrees.}$$

So, the **90 degree angle** (the right angle) is the quadrant. (**Section c.**)

Question 16

Answer: 20 pixels high

Identify the information you are given and what you need to find:

Area = 500 pixels

Length = 25 pixels

Height = ?

Find an equation that relates the above variables:

The equation for the area of a rectangle is Area = length x height

Substitute in the known values and solve:

$$500 = 25 \times \text{height}$$

$$\text{height} = 500/25$$

$$\text{height} = 20.$$

The graphic is 20 pixels high.

Question 17

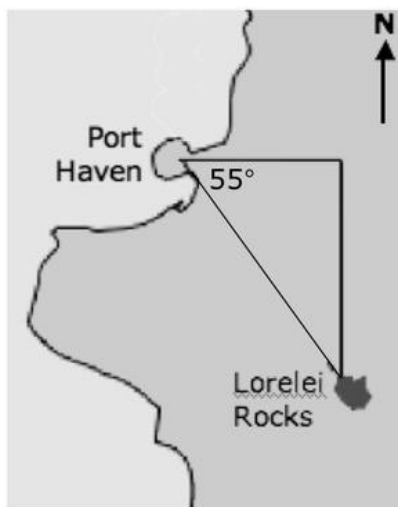
Answer: B

Because the astronaut is using standard MASSES, gravity will not be relevant (as it will be same for the rock as it is for the standard masses, whether they are measured on the Moon or on Earth).

Hence, the moonrock will have a MASS on Earth of 540g.

Question 18

Answer: C



Lorelei Rocks is to the South and to the East of Port Haven. When using compass directions, always put either North or South first, and then adjust the direction with a number of degrees in the Easterly or Westerly direction:

Here, we begin with South and then work out how many degrees to the East Lorelei Rocks is from Port Haven. The bearing of 55 degrees given in the diagram is how many degrees SOUTH of EAST Lorelei Rocks is. We need to know how many degrees EAST of SOUTH. To do this, simply subtract 55 from 90 degrees: $90 - 55 = 35$ degrees.

The bearing of Lorelei Rocks from Port Haven is **S35°E** (read as: South and 35 degrees East).

Question 19

Answer: A

George needed to be at assembly at 8.55 am. We add 1 hr 15 min to this time. We could either add on 1 hr (to 9.55 am) and then another 15 minutes, bringing the time to 10.10am, or we could do an addition like this:

Hours:

$$8 + 1 = 9$$

Minutes:

$$55 + 15 = 70$$

$$70 \text{ min} = 1 \text{ hr } 10 \text{ min}$$

Adding these back together we get: $9 + 1 \text{ hr } 10 \text{ min} = 10:10 \text{ am}$

We then check on the timetable to see what subject is scheduled at that time, and we find that Maths started at 9.50am and would continue until 10.20am.

Question 20

Answer: B

The area of the pentagon, A sq. units, is the sum of the five shapes that make up the composite. The area of a triangle is $\frac{1}{2}bh$.

For triangle 1, the area is $\frac{1}{2}ah_1$. For triangle 2, the area is $\frac{1}{2}dh_2$. For triangle 3, the area is $\frac{1}{2}(a+b)h_3$. For triangle 4, the area is $\frac{1}{2}(c+d)h_3$.

For a trapezium, the formula for area is $\frac{1}{2}(a+b)h$. In the case of our trapezium, this becomes $\frac{1}{2}(b+c)(h_1+h_2)$.

We can now add each of these areas. $\frac{1}{2}ah_1 + \frac{1}{2}dh_2 + \frac{1}{2}(a+b)h_3 + \frac{1}{2}(c+d)h_3 + \frac{1}{2}(b+c)(h_1+h_2)$.

The answer we have here is correct, but to simplify, we can factor out the common term, $\frac{1}{2}$:

$$\frac{1}{2}\{ah_1 + dh_2 + (a+b)h_3 + (c+d)h_3 + (b+c)(h_1+h_2)\}$$

We can also factor the two bolded terms, because they both include h_3 :

$$\frac{1}{2}\{ah_1 + (b+c)(h_1+h_2) + dh_2 + (a+b+c+d)h_3\}$$