Sample Exam 5 – Solutions
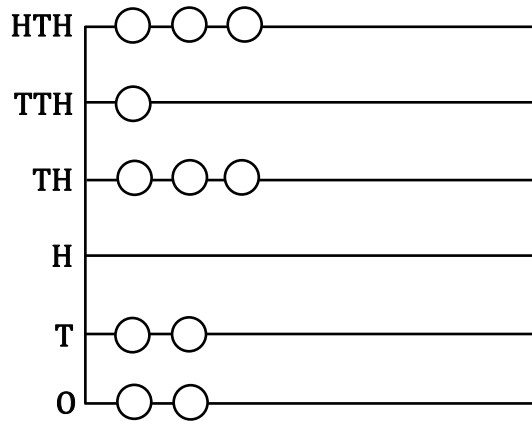
Session 5   **Total: 75 marks**

SECTION I

1. Write down the numeral represented below.   [1]

Place	
HTH	○—○—○————————
TTH	○————————————
TH	○—○—○————————
H	————————————
T	○—○————————
O	○—○————————

Answer_____ 313 022 _____

2. What is $\frac{39}{4}$ as a mixed number?   [1]

4 fourths = 1 whole,

39 fourths = 39 ÷ 4

39 fourths = 9 wholes and 3 fourths

So, 39 fourths will be equivalent to $9\frac{3}{4}$

Answer_____ $9\frac{3}{4}$ _____

3. $5^2 - \sqrt{49} =$ [1]

$5^2 = 5 \times 5$

$= 25$

$\sqrt{49} = 7$ since $7 \times 7 = 49$

So, $5^2 - \sqrt{49} = 25 - 7$

$= 18$

Answer_____ 18 _____

4. Subtract 4.91 from 6.42 [1]

$$\begin{array}{r} 6\,.\,4\,2 \\ -\ \ 4\,.\,9\,1 \\ \hline 1\,.\,5\,1 \\ \hline \end{array}$$

Answer_____ 1.51 _____

5. A large box containing 259 crayons were equally divided into 7 sections. How many crayons were in each section? [1]

7 sections = 259 cookies

1 section = $259 \div 7$

$= 37$ crayons

Answer_____ 37 _____ crayons

6. Marcus bought these three items.

$31.50 $8.20 $14.50
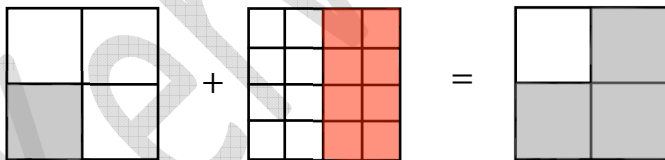
What was the total cost of these three items?   [1]

$ 3 1 . 5 0

$ 8 . 2 0

+ $ 1 4 . 5 0
_____

$ 5 4 . 2 0
_____

Answer $_____ 54.20 _____

7. Shade the fraction of the second shape to complete the statement below.   [1]

8. Insert the missing numbers in the boxes below. [1]

```
    7  4  1
+   3  2  6
-----------
  1 0  6  7
-----------
```

To get the 7 in the ones column, the sum of the ones must end in 7.

Adding the ones: $1 + \boxed{} = 7$, $\boxed{} = 6$

To get the 6 in the tens column, the sum of the tens must end in 6.

Adding the tens: $\boxed{} + 2 = 6$, $\boxed{} = 4$

9. 2 640 m = _____ km [1]

$1000 \text{ m} = 1 \text{ km}$

$1 \text{ m} = \frac{1}{1000} \text{ km}$
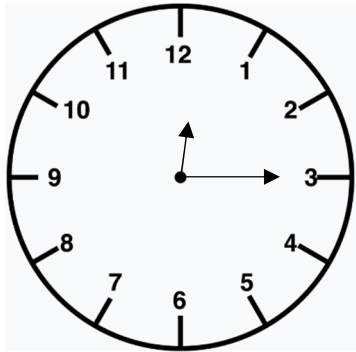
$2640 \text{ m} = \frac{1}{1000} \times 2640 \text{ km}$

$\phantom{2640 \text{ m}} = 2.64 \text{ km}$

Answer_____ 2.64 _____ km

10. What is the time shown on the clock below? [1]

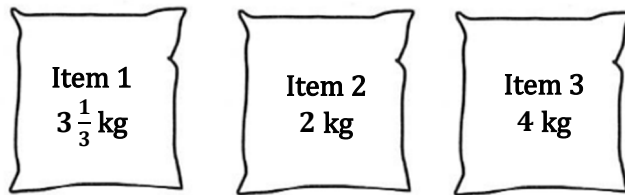The minute hand points to 3, which indicates 15 minutes pass the hour.

The hour hand is slightly after 12, so the hour of 12 has been passed.

The time is 15 minutes past 12 or a quarter past 12 or 12:15.

Answer_____ 12:15 _____

11. Chase bought three mystery items at the store. The mass of each item is shown below.

Item 1
$3\frac{1}{3}$ kg

Item 2
2 kg

Item 3
4 kg

Calculate the **total** mass of the three items. [1]

$$3\frac{1}{3}$$
$$2$$
$$+\quad 4$$
$$\overline{\quad9\frac{1}{3}\quad}$$

Answer_____ $9\frac{1}{3}$ _____ kg

12. Write down the length of the object. [1]
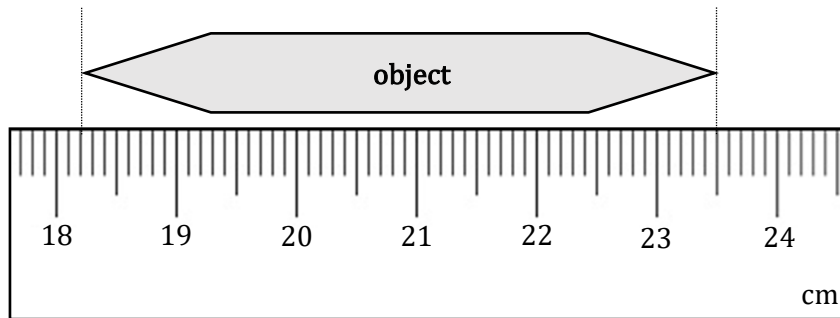
Length of the object = 23.5 − 18.2

```
    2 3 . 5
−   1 8 . 2
_____
      5 . 3
_____
```

Length of the object = 5.3 cm

Answer_____ 5.3 _____ cm

13. From the list below, circle the most appropriate metric unit for measuring the mass of a watermelon
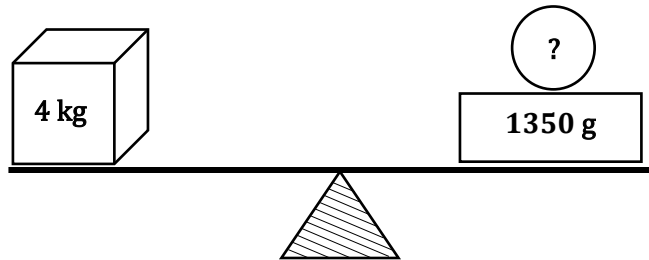   shown below. [1]

milliltre   gram   millimetre   kilogram

14. Three objects are placed on the scale as shown below. The scale is now balanced.

What is the mass of the circular object? [1]

Mass of circular object = 4 kg – 1350 g

$$= 4000 - 1350$$

$$= 2650 \text{ g}$$

Answer_____ 2650 _____ g

15. Write down the name of a solid that has a uniform cross-section. [1]
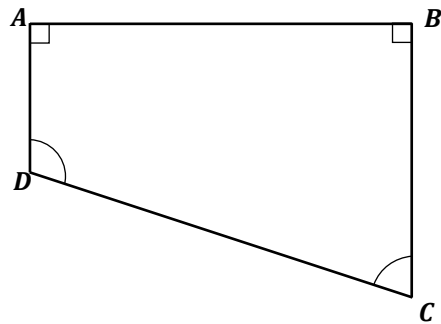
A cylinder has a uniform cross-section.

Other solids include cube, cuboid or any prism. For instance, a triangular prism.

Answer_____ cylinder _____

16. Which angle in the shape below is **more than** a right angle? [1]
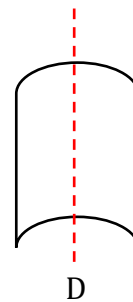

A and *B* are right angles (90°).

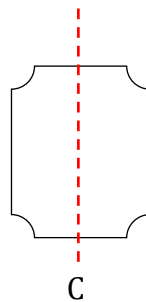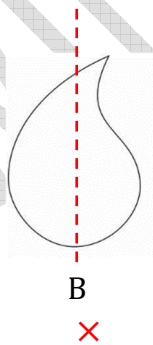*C* is acute (less than 90°).

D is obtuse (more than 90°).

Answer_____ *D* _____

17. Which of the shapes shown below is NOT symmetrical? [1]

A   B   C   D

✕

Answer_____ *B* _____

18. How many individual quarter turns must Hannah make to get to the mall? [1]

Answer_____ 4 _____ quarter turns

19. The table below shows the number of books sold in three weeks.

Week	Number of Books Sold
Week 1	43
Week 2	36
Week 3	38

Calculate the mean number of books sold on a weekly basis. [1]

$$\text{Mean number of books sold} = \frac{\text{Total number of books sold over three weeks}}{\text{Number of weeks}}$$

$$= \frac{43+36+38}{3}$$

$$= \frac{117}{3}$$

$$= 39$$

Answer_____ 39 _____ books

20. The incomplete bar graph below shows the number of students and the hobbies they enjoyed. A total of 120 students indicated their favourite hobby.
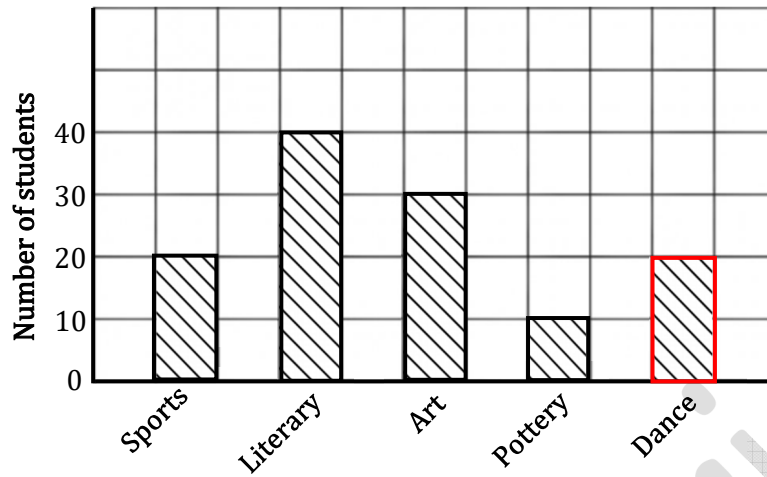
Draw the bar to show the number of students who likes to dance. [1]

Number of students who like sports   =   20

Number of students who like literary   =   40

Number of students who like art   =   30

Number of students who like pottery   =   10   +
                                               ——————
                                               100
                                               ——————

So, the number of students who like dance = 120 − 100

                                          = 20

21. Thirty-five erasers fit exactly along the length of whiteboard. Each eraser has a length of 4.2 cm. Calculate the **total** length of the whiteboard. [2]

Total length of the whiteboard = Length of 1 eraser × Number of erasers

$$= 4.2 \text{ cm} \times 35$$

$$= 147 \text{ cm}$$

Answer_____ 147 _____ cm

22. Five-ninths of a certain number is 30. What is two-thirds of the same number? [2]

$\frac{5}{9}$ of a number is 30.

The number is:

$30 \div \frac{5}{9} = \frac{30}{1} \times \frac{9}{5}$

$$= 54$$

Now,

$\frac{2}{3}$ of $54 = \frac{2}{3} \times \frac{54}{1}$

$$= 36$$

Answer_____ 36 _____

23. The number of cherries that Sasha has is a factor of 48. She ate four and now, the number of cherries is a multiple of 5. How many cherries does Sasha now have?   [2]

Factors of 48 are: 1, 2, 3, 4, 6, 8, 12, 16, 24 and 48.

Let the number of cherries Sasha has be 24 cherries.

If she ate four, then she has $= 24 - 4$

$= 20$ cherries

The number 20 is a multiple of 5.

Hence, Sasha now has 20 cherries.

Answer_____ 20 _____ cherries

24. The restaurant owner bought a barrel of 70 apples of three different types: red, green and yellow. There are 14 yellow apples and an equal number of red and green apples. What percentage of the apples are green? [2]

Total number of apples $= 70$

Number of yellow apples $= 14$

Therefore, the number of red and green apples together $= 70 - 14$

$$= 56$$

The number of red and green apples is the same, so there are $= 56 \div 2$

$$= 28 \text{ each}$$

Percentage of green apples $= \frac{Number\ of\ green\ apples}{Total\ number\ of\ apples} \times 100\%$

$$= \frac{28}{70} \times 100\%$$

$$= \frac{2}{5} \times 100\%$$

$$= 40\%$$

Answer_____ 40 _____ %

25. A pattern is formed using dots as shown below.

Figure 1   Figure 2   Figure 3   Figure 4   Figure 5
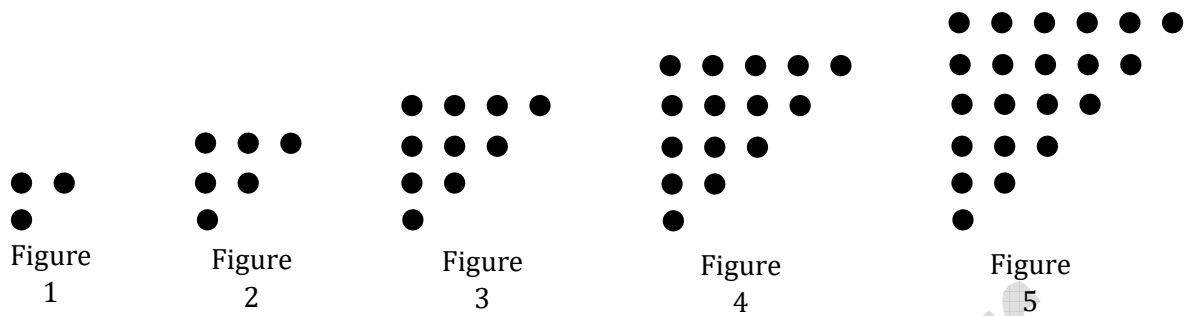
How many dots will form Figure 10? [2]

| Figure	Number of Dots
1	3
2	6
3	10
4	15
5	21
6	$21 + 7 = 28$
7	$28 + 8 = 36$
8	$36 + 9 = 45$
9	$45 + 10 = 55$
10	$55 + 11 = 66$

Answer_____ 66 _____ dots

26. Consider the fractions $\frac{3}{4}$ and $\frac{5}{8}$. Using words or diagrams to explain your answer, are the two fractions equal to each other? [3]

$$\frac{\text{Numerator}}{\text{Denominator}}$$

→ tells us how many of the parts we are considering

→ tells us how many parts the whole is divided into

So, $\frac{3}{4} = \frac{6}{8}$ means we are looking at six parts of a whole divided into 8 parts.

$\frac{5}{8}$ means we are looking at five parts of a whole divided into 8 parts.

$\frac{6}{8}$

$\frac{5}{8}$
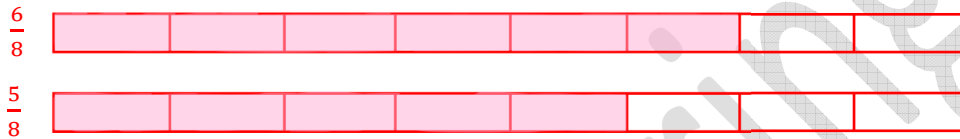
The diagrams show that $\frac{6}{8}$ is not equal to $\frac{5}{8}$.

In general, if we have the same denominators but different numerators, then the fractions will not be the same.

Hence, $\frac{3}{4}$ is not equal to $\frac{5}{8}$.

Answer_____ No, the two fractions are not equal to each other _____

27. A person goes to a hair salon and get their hair done for $320. They want to leave a tip of 15% for their stylist. How much is the stylist paid altogether? [2]

Cost = $320

Tip = 15% of cost

$= 15\%$ of $320

$= \frac{15}{100} \times \frac{320}{1}$

$= \frac{3}{20} \times \frac{320}{1}$

$= \$48$

Total = $320 + $48

$= \$368$

Answer $_____ 368 _____

28. Darian receives a salary of $2400 per month. He received a bonus of $\frac{1}{5}$ of his salary each quarter.

How much money did Darian receive for the entire year? [3]

One year has 4 quarters.

Fraction of money Darian receives $= \frac{1}{5} \times 4$

$$= \frac{4}{5}$$

Bonus received $= \frac{4}{5} \times \$2400$

$$= \$1920$$

Amount of money Darian received for the entire year $= \$2400(12) + \$1920$

$$= \$28\ 800 + \$1920$$

$$= \$30\ 720$$

Answer $_____ 30 720 _____

29. (a) Draw a quadrilateral with **one pair** of parallel sides and **two** right angles.   [2]
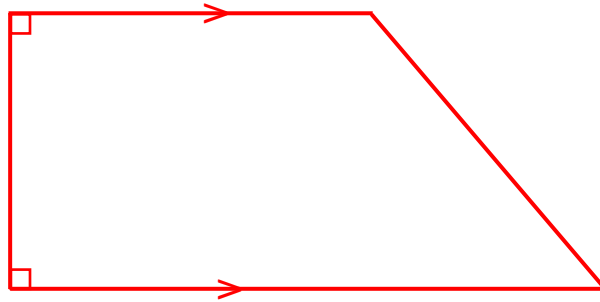
(b) Write the name of the quadrilateral.   [1]

Answer_____ trapezium _____

30. At a parade, 25% of the attendees are wearing white, $\frac{3}{8}$ are wearing black, 0.2 are wearing blue and the remaining 14 attendees are wearing green. How many attendees are at the parade?   [3]

Fraction of attendees wearing white, black and blue $= 25\% + \frac{3}{8} + 0.2$

$$= \frac{1}{4} + \frac{3}{8} + \frac{1}{5}$$

$$= \frac{10}{40} + \frac{15}{40} + \frac{8}{40}$$

$$= \frac{10+15+8}{40}$$

$$= \frac{33}{40}$$

Fraction of attendees wearing green $= 1 - \frac{33}{40}$

$$= \frac{40}{40} - \frac{33}{40}$$

$$= \frac{7}{40}$$
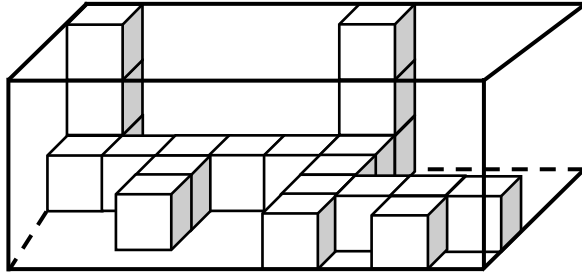
Now,

7 parts $= 14$ attendees

1 part $= \frac{14}{7}$

$= 2$ attendees

40 parts $= 40 \times 2$

40 parts $= 80$ attendees

Answer_____ 80 _____ attendees

31. Consider the diagram below.

How many **more** cubes are required to completely fill the cuboid that has small identical cubes inside, as shown above? [3]

Length of cuboid $= 9$ cubes

Width of cuboid $= 5$ cubes

Height of cuboid $= 3$ cubes

Number of cubes to fill the cuboid $= 9 \times 5 \times 3$

$= 135$ cubes
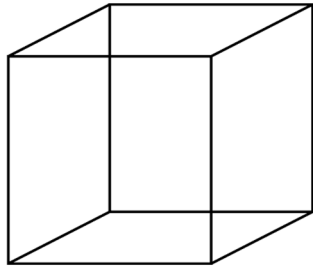
Number of cubes presently in box $= 21$ cubes

Number of more cubes required to fill the box completely $= 135 - 21$

$= 114$ cubes

Answer _____ 114 _____ cubes

32. Two triangles are shown below.

Shape *P*   Shape *Q*

Write two differences in the properties of Shape *P* and Shape *Q*.   [2]

Answer: Shape *P* has three lines of symmetry whereas Shape *Q* has one line of symmetry.

Shape *P* has three equal sides whereas Shape *Q* has two equal sides.

Shape *P* has three equal angles whereas Shape *Q* has two equal angles.

33. Using the line *AB* as the line of symmetry, complete the shape below.   [3]

34. Ria has the solid shown below made up of six squares. Each edge measures 6 cm.

(a) Write down the name of the solid. [1]

Answer_____ cube _____

(b) What is the total length of all the edges? [1]

A cube has 12 edges.

Each edge measures 6 cm.

Total length of all edges $= 12 \times 6$

$= 72$ cm

Answer_____ 72 _____ cm

(c) Ria stuck 14 pins on EACH face. How many pins did she use? [1]

There are 6 faces.

14 pins are stuck on each face.

Therefore, the number of pins stuck will be $= 14 \times 6$

$= 84$ pins

Answer_____ 84 _____ pins

35. A merchant bought 40 shirts at $15.00 each and sold them at 4 for $75.00.

    Calculate the amount of profit the merchant made. [2]

Cost of 40 shirts @ $15.00 each $= 40 \times \$15.00$

$$= \$600.00$$

The shirts were sold at 4 for $75.00.

Amount of money received for the sale of 40 shirts $= \dfrac{40}{4} \times \$75.00$
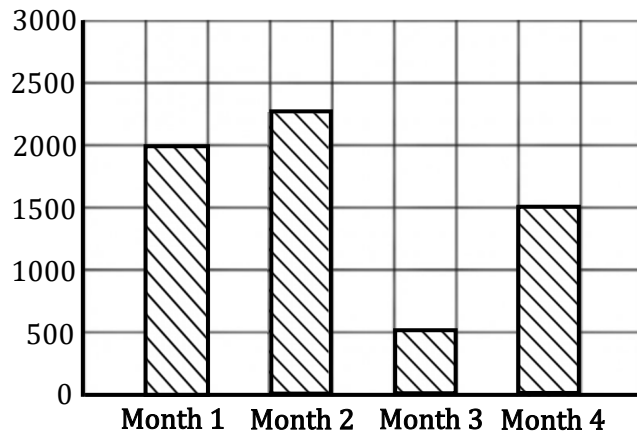
$$= 10 \times \$75.00$$

$$= \$750.00$$

Hence,

Profit $= \$750.00 - \$600.00$

$$= \$150.00$$

Answer $\$$_____150_____

36. The chart below shows the number of products manufactured by a factory in four months.

How many products were manufactured during the four months? [2]

In month 1, number of products manufactured = 2000

In month 2, number of products manufactured = 2250

In month 3, number of products manufactured = 500

 In month 4, number of products manufactured = 1500 +
_____
Total = 6250

Answer_____ 6250 _____ products

SECTION III

37. Nathan is selling four different types of fruits at a market.

The average price of the two cheapest fruits is $3.

The average price of the three cheapest fruits is $6.

The average price of all four fruits is $8.

What are the prices of the four fruits in ascending order? [4]

Sum of first two numbers = 3×2

$= 6$

Sum of first three numbers = 6×3

$= 18$

Sum of first four numbers = 8×4

$= 32$

Fourth number = $32 - 18$

$= 14$

Third number = $18 - 6$

$= 12$

Remaining two numbers must add to = $32 - (14 + 12)$
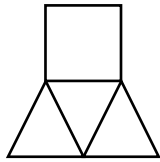
$= 32 - 26$

$= 6$

So, the remaining two numbers must add to 6 and be odd.

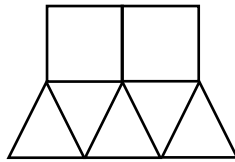Possible combinations include: 0 and 6 , 1 and 5 , 2 and 4 , 3 and 3

The only combination that adds to 6 and both numbers are odd is: 1 and 5

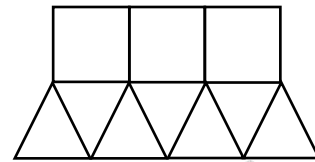Answer $_____ 1 _____ , $_____ 5 _____ , $_____ 12 _____ , $_____ 14 _____

38. Using metal rods, the following pattern was made. In Pattern 1, 10 metal rods were used to construct one square and 3 triangles.

Pattern 1   Pattern 2   Pattern 3

(a) How many metal rods will be used to build a pattern with 6 squares?   [1]

A pattern with 1 square requires 10 metal rods.

A pattern with 2 squares requires 16 metal rods.

A pattern with 3 squares requires 22 metal rods.

A pattern with 4 squares requires 28 metal rods.

A pattern with 5 squares requires 34 metal rods.

A pattern with 6 squares requires 40 metal rods.

$$10 \xrightarrow{+6} 16 \xrightarrow{+6} 22 \xrightarrow{+6} \overset{4^{th}}{28} \xrightarrow{+6} \overset{5^{th}}{34} \xrightarrow{+6} \overset{6^{th}}{40}$$

Answer_____ 40 _____ metal rods

(b) A total of 70 metal rods are used to build a similar pattern.

Calculate the number of triangles in this pattern. [3]

$$4^{th} \quad 5^{th} \quad 6^{th} \quad 7^{th} \quad 8^{th} \quad 9^{th} \quad 10^{th} \quad 11^{th}$$

$$28 \xrightarrow{+6} 34 \xrightarrow{+6} 40 \xrightarrow{+6} 46 \xrightarrow{+6} 52 \xrightarrow{+6} 58 \longrightarrow 64 \longrightarrow 70$$

Therefore, 11th pattern will have 70 metal rods.

The 11th pattern will consist of 11 squares.

So, the number of triangles in the 11th pattern $= 11 + 12$

$$= 23 \text{ triangles}$$

Answer_____ 23 _____ triangles

39. The diagram below shows the blades of a propeller labelled L, M, N and O.
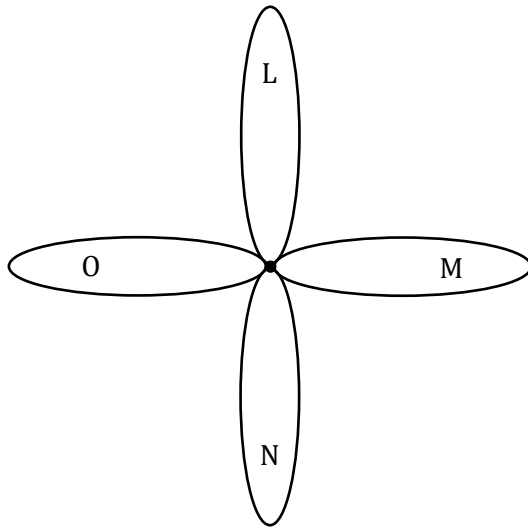
(a) What fraction of a turn does Blade M make if it turns in an anticlockwise direction to the position of Blade N? [1]

Answer_____ $\frac{3}{4}$ turn _____

(b) How many $\frac{1}{4}$ turns does Blade L make if it turns in a clockwise direction to the position of Blade N? [1]

$\frac{180°}{360°} = \frac{2}{4}$

$= 2 \times \frac{1}{4}$

Answer_____ 2 _____

(c) Through how many degrees does Blade O turn in a clockwise direction to the position of Blade N? [1]

Answer_____ 270 _____ degrees

(d) If Blade L travels 200 cm in 1 whole turn, how many $\frac{1}{4}$ turns will it take to make 650 cm? [1]

200 cm = 1 whole turn

 50 cm = 1 quarter turn

650 cm = $\frac{650}{50}$

= 13 quarter turns

Answer_____ 13 _____ turns

40. (a) Using the square grid below, join four dots to form a quadrilateral with no right angles and contains 2 pairs of parallel sides. [3]
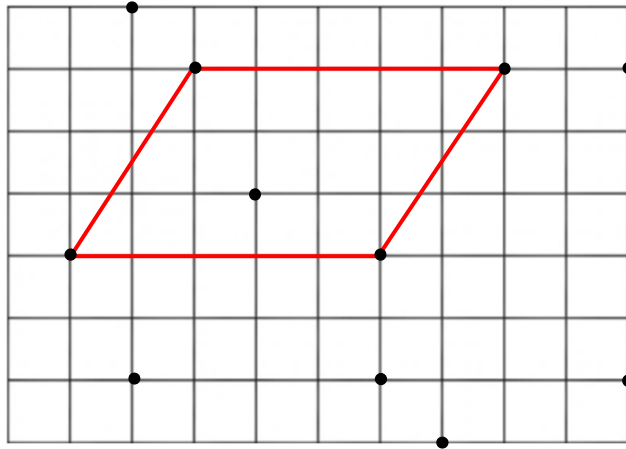
(b) Name the type of quadrilateral drawn. [1]

Answer_____ parallelogram _____