‘0’ LEVEL MATHEMATICS

REVISING STRATEGIES

QUESTIONS BOOKLET

1 000 MARKS

TOPIC BY TOPIC

The time is now, let us revise together

Tinofamba nevanofamba

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FRACTIONS

1. $3\frac{1}{3} - 2\frac{1}{6}$ **(2)**

2. $1\frac{1}{2} + 3\frac{1}{4} - 4\frac{1}{8}$ **(2)**

3. $3\frac{1}{8} \div 8\frac{1}{3}$ **(2)**

4. $\frac{9}{13} - \frac{7}{11}$ **(2)**

5. $2\frac{2}{11}(4\frac{1}{4} - 3\frac{1}{3})$ **(3)**

6. $\frac{1}{3} + \frac{2}{5} - \frac{1}{2}$ **(2)**

7. $1\frac{3}{4} - 2\frac{5}{8}$ **(2)**

8. $\frac{5}{8} + \frac{3}{4} \times \frac{1}{3}$ **(2)**

9. $\frac{1}{3} \div (\frac{1}{4} + \frac{1}{6})$ **(3)**

10. $(3\frac{1}{8} - 2\frac{1}{3}) \div (4\frac{1}{2} + 1\frac{5}{6})$ **(4)**

11. $\frac{4+9}{8\times3}$ **(2)**

12. $\frac{5}{7}$ of $4\frac{1}{5}$ **(2)**

13. $3\frac{2}{5} \div 1\frac{7}{10} \times \frac{2}{5}$ **(2)**

14. $5\frac{1}{4} \times \frac{6}{7}$ **(2)**

15. $1\frac{3}{4} \div 1\frac{1}{6}$ **(2)**

16. $1\frac{1}{3} - \frac{4}{15} + \frac{7}{10}$ **(3)**

17. $1\frac{7}{18} + 2$ **(2)**

18. $\frac{3}{8} - \frac{5}{24}$ **(2)**

19. $\frac{1}{5} + \frac{2}{7}$ **(1)**

20. $\frac{7}{9}$ of $(\frac{2}{3} - \frac{5}{12})$ **(2)**

STANDARD FORM

1. Given that $x = 3 \times 10^6$ $\quad y = 4 \times 10^9$

Find the value of the following leaving your answers in standard form

a. x^2 **(2)**

b. xy **(2)**

c. $\frac{x}{y}$ **(2)**

2. $x = 8{,}4 \times 10^2$

$y = 9 \times 10^2$

$z = 2 \times 10^{-5}$

Find (a) xy **(2)**

(b) yz **(2)**

(c) $\frac{xy}{z}$ **(2)**

3. $(4 \times 10^2) + (6 \times 10^2) + (1 \times 10^5)$ Giving your answer in standard form. **(2)**

4. Express 0,0075 in standard form **(1)**

5. $m = 4{,}\ 2 \times 10^5$

$n = 7 \times 10^{-7}$

Find (a) mn **(2)**

(b) $\frac{m}{n}$ **(2)**

(c) $\frac{6n}{m}$ **(2)**

6. The distance of Saturn from the Sun is 1507 million kilometres.
Express 1507 million in standard form. [1]

NUMBER BASES

Find the values of

1. $312_5 + 43_5$ **(1)**
2. $214_5 + 132_5$ **(1)**
3. Given that $110_3 = 14_x$, find x **(3)**
4. $431_5 - 244_5$ giving your answer in base 10 **(2)**
5. Express 204_5 as a number in base 10 **(1)**
6. $120_3 = 13_x + 10_x$ find x **(3)**
7. $45_8 – 1101_{10}$ in base 7 **(3)**
8. 432 -123 in base 4 **(2)**
9. $333_{10} + 33_5$ in base 5 **(2)**
10. $4015_7 + 3604_7$ **(1)**
11. $1012_3 – 221_3$ **(1)**
12. $23_x = 21$ find x **(3)**
13. Express 214_6 as a number in base 10 **(1)**
14. $23_5 – 32_5 + 33_5$ **(2)**

FACTORISE COMPLETELY

1. $8x^2 - 8$ **(2)**

2. $y^2(x-2) - x + 2$ **(2)**

3. $3 - 12y^2$ **(2)**

4. $2x^2 + ax - 2bx - ab$ **(2)**

5. $ax + bx - 2a - 2b$ **(2)**

6. $36 - 4p^2$ **(2)**

7. $k^2 + 4k - 21$ **(2)**

8. $2x^2 + 5x - 3$ **(2)**

9. $1 + y + y^2 + y^3$ **(2)**

10. $2\pi\text{rh} + 2\pi r^2$ **(1)**

11. $2x^2 - 50$ **(2)**

12. $a^2 - 16$ **(1)**

13. $xy - 3y + 7x - 21$ **(2)**

14. $a^2 - 4a - ab + 4b$ **(2)**

15. $x^2 - 1$ **(1)**

16. $x^2 - y^2$ **(1)**

17. $x^2 + 7x + 10$ **(2)**

18. $x^2 - x - 30$ **(2)**

19. $2x^2 + 9x + 4$ **(2)**

20. $77 - 26x - 3x^2$ **(2)**

21. $8 - 10y + 12x - 15xy$. **(2)**

INDICES

Evaluate the following indices

1. 4^{-2} **(1)**

2. $81^{\frac{3}{4}}$ **(1)**

3. Find x if $9^{x-1} \times 3^{3x-2} = 1$ **(2)**

4. Given that $\frac{2^{-2} \times 2^{c}}{2^{4}} = 2^{3}$, find the value of c **(2)**

4. 250° **(1)**

5. 3^{-2} **(1)**

6. $(3x^2)^2$ [1]

7. -31^{0}, [2]

8. $(\frac{1}{5})^{-3}$ **[2]**

9. $15x^3 \div 5x^2$ **[1]**

10. $0{,}05^2$ **(1)**

11. $\sqrt[3]{0{,}027}$ **(1)**

12. $\frac{(3^3)}{27^3}$ **(2)**

13. $m^8 \div m^{n} = m^{-3}$ find n **(2)**

14. Simplify $2m^3 \times 3m^0$. **(1)**

15. Evaluate $\sqrt{12\frac{1}{4}}$ **(1)**

LOGARITHMS

1. Given log3= 0,477   log5 = 0,699, find

a. log 45 **(2)**

2. $\frac{\log 9 + \log 3}{\log 27 - \log 9}$ **(3)**

3. $\log_2 32$ **(1)**

4. $\frac{\log 3 + \log 9}{\log 405 - \log 5}$ **(2)**

5. $\frac{3}{4}\log 16$ **(2)**

6. $\log_3 63 - log_3 7$ **(2)**

7. $log_3 81$ **(1)**

8. $\frac{log 16}{log\ 8}$ **(2)**

9. $Express\ log^{10}x + 2\ log^{10}y = 1\ as\ an\ equation\ in\ index\ form$ **(3)**

10. $\frac{log 8}{log 4}$ **(2)**

11. Evaluate: $\log_8 32 + \log_8 16$ **(3)**

12. Given $\log\ 2 = 0{,}301$, $\log\ 3 = 0{,}477$, $\log\ 5 = 0{,}699$, $\log\ 7 = 0{,}845$

Find, (a) $\log\ 10$ **(1)** (b) $\log\ 2\ \frac{1}{2}$ **(2)** (c) $\log\ 625$ **(2)**

(d) $\log\ 0{,}7$ **(2)** (e) $\log\ 250$ **(2)**

17. Evaluate

a) $\frac{log\ 36 - log\ 4}{log\ 15 - log\ 5}$ **(3)**

b) If log(2x +21) – log5x = 0, find the value of x. **(3)**

c) 2 log 8 + log 25 – log 16 **(2)**

EQUATIONS

1. $(x-3)^2+(x+6)(x-3)=5$ **(5)**

2. $\frac{3}{m}-\frac{5}{4m}=2$ **(2)**

3. $\frac{1}{n}=2-\frac{2}{3n}$ **(2)**

4. $x(3x+2)=0$ **(2)**

5. $\frac{x+1}{3}+\frac{2x-1}{2}=\frac{7}{6}$ **(2)**

6. $(x-1)^2=9$ **(2)**

7. $\frac{x}{3}=\frac{27}{x}$ **(2)**

8. $3x(x+4)+45=3(x^2+1)$ **(3)**

9. $5+2x=7-5x$ **(2)**

10. $\frac{x}{2}=6$ **(1)**

11. $\frac{3y}{5}-\frac{1}{4}=0$ **(2)**

12. $\frac{7}{a-4}=\frac{2}{a-3}$ **(2)**

13. $3x^2=147$ **(2)**

14. $4-\frac{2}{3}(x-7)=\frac{4}{5}$ **(2)**

15. $5-(x-3)-2x=-1$ **(2)**

16. $3y-2(2y-7)=2(3+y)-4$ **(2)**

17. $\frac{2x}{2}+1=\frac{x}{10}$ **(2)**

DECIMALS, SIGNIFICANT FIGURES AND PERCENTAGES

1. Express 1548 to

(a) One significiant figure **(1)**

(b) The nearest ten **(1)**

2. Express 0,00349 to

(a) One significant figure **(1)**

(b) Two significant figure **(1)**

(c) Three decimal places **(1)**

(d) Four decimal places **(1)**

3. $\frac{13}{40}$ as a decimal fraction. **(1)**

4. Express 0,016

(a) to 1 Significant figure **(1)**

(b) in standard form **(1)**

5. Round off 2,08842 to

(a) 1 decimal place **(1)**

(b) 2 decimal place **(1)**

(c) 3 decimal place **(1)**

(d) 4 decimal place **(1)**

6. Express the following as percentages

(a) $\frac{14}{25}$ **(1)**

(b) 0,094 **(1)**

(c) $1\frac{1}{3}$ **(1)**

(d) $\frac{1}{2}$ **(1)**

(e) 0,0043 **(1)**

POLYGONS AND BEARING

1. A polygon has 8 equal sides

(a) state the special name of the polygon. **(1)**

(b) calculate the size of the interior angles of the polygon. **(2)**

2. The sum of the interior angles of a polygon is 2340˚. Calculate the number of sides of the polygon. **(2)**

3. Calculate the size of the interior angle of a regular eight sided polygon. **(2)**

4. Write down the special name of the regular polygon which has three lines of symmetry.

5. The bearing of A from B is 243˚. Write down the three figure bearing of B from A.

6. The bearing of town B from town AIS 141˚. Find the bearing of town A from town B. **(2)**

7. The interior angle of a regular polygon is 162˚.

Find the number of sides of the polygon. **(2)**

8. The bearing of village X from village Y is 109˚

Find : (a) The three figure bearing of Y from X **(2)**

(b) The compass bearing of Y from X. **(1)**

9. The sum of interior angles of a polygon is 3 240°. Three of its interior angles are 140° , 110° and 100°. The rest are equal.

Find the size of each of the equal angles. **(4)**

10. Each interior angle of a regular polygon is 175°. Find the number of sides in the polygon. **(2)**

SIMULTANEOUS EQUATIONS

1. $6x + 4y = 3$ **(3)**

$4x + 6y = 5$

2. $x + y = 7$ **(3)**

$2x - y = 8$

3. $4x - y = -8$ **(3)**

$3x - y = -6$

4. $3x + 4y = 7$ **(3)**

$3x - 4y = -1$

5. 3x - 2y =8

5x - 4y =12 **(3)**

6. 3x – y = 7

y = 5 – x **(3)**

7. 2p + 3q = 1

p – 4q = 17 **(3)**

8. 3x + y = 1

2x + y = 5 **(3)**

SUBJECT OF FORMULA

1.	$s = ut + \frac{1}{2}at^2$	**(a)**	**(3)**
2.	$m(x + y) = x + 5m - 5$	**(m)**	**(3)**
3.	$y = \frac{t-3}{1-t}$	**(t)**	**(3)**
4.	$A = \pi r^2$	**(r)**	**(3)**
5.	$\frac{x}{a} + \frac{y}{b} = 1$	**(b)**	**(3)**
6.	$T = W + Wv^2$	**(W)**	**(3)**
7.	$A = \pi r\ (h^2 - r^2)$	**(h)**	**(3)**
8.	$a(x - 1) = b$	**(x)**	**(3)**
9.	$P = \sqrt{\frac{3x-p}{3}}$	**(x)**	**(3)**
10.	$a + bx = c$	**(x)**	**(3)**

11. Given that P = $\frac{n}{2}\{2a + (n - 1)d\}$

(i) Express a in terms of d, n and P **(3)**

(ii) Find the value of a when n=10 ,d= 4 and P=20 **(2)**

12. If dx = r + qx

i. Find the value of d when q = 3, r = -1 and x = 2, **(2)**

ii. Express x in terms of d, q and r. **(3)**

13. Make R the subjectof the formula Q = m + nR^2 **(3)**

MATRICES

1. $C = \begin{pmatrix} 2 & -3 \\ 0 & 4 \end{pmatrix} D = \begin{pmatrix} 5 & -2 \\ -7 & 1 \end{pmatrix}$

$find \quad (\boldsymbol{a}) \ C - 2D$ **(2)**

$(\boldsymbol{b}) \ D^2$ **(2)**

2. $A = \begin{pmatrix} -1 & 0 \\ 2 & 3 \end{pmatrix} B = \begin{pmatrix} x & 2 \\ 8 & x \end{pmatrix}$

(a) $find\ AB\ in\ terms\ of\ x$ **(2)**

(b) $find\ x\ such\ that\ Bis\ a\ singular\ matrix.$ **(2)**

3. Given that A= $\begin{pmatrix} 1 & 2 \\ 0 & 1 \end{pmatrix}$ $B = \begin{pmatrix} 3 & 1 \\ 2 & 0 \end{pmatrix}$, find

(i) 2A + B [2]

(ii) B – A [2]

(iii) B^{-1} [2]

(iv) BA [2]

(v) B^2 [2]

4. It is given that M = $\begin{pmatrix} 2x & x \\ x & 2x \end{pmatrix}$.

(a) Find M^2 in terms of x. **[2]**

(b) find x given also that $|M|$ = 48. **[2]**

INEQUALITIES

1. $Solve\ y - 4 < 3y + 2 \leq 6 - y$
$and\ list\ all\ the\ intergral\ value\ of\ y\ that\ satisfy\ the\ inequality.$ **(4)**

2. $Solve\ : 3n - 25 \leq 2$ **(2)**

3 (a) $Solve: 5x - 6 < 2x - 3 \leq 3x + 1 \quad giving\ your\ answer\ in\ the\ form$

$a \leq x < b\ where\ a\ and\ b\ are\ intergers.$ **(4)**

(b) $illustrate\ the\ solution\ on\ number\ line.$ **(1)**

4 (a) $Solve\ : 5 - 3x\ \leq 7 < -2x + 19$ **(4)**

(b) $Illustrate\ the\ solution\ on\ a\ number\ line.$ **(1)**

5. $Solve\ : -7 < 2 - 3x \leq 5$ **(2)**

6. $Solve\ : 3x - 5 > 21$ **(2)**

7. $Solve\ : 14 \geq 2 - 3x$ **(2)**

8. $List\ the\ interger\ value\ of\ 6 \leq 2x + 1 \leq 11$ **(3)**

9. a) (i) Solve the inequality $x - 3 < 4 - 2x \leq x + 13$ **(4)**

(ii) Illustrate your solution in part **a(i)** on a number line. **(1)**

10.a) Given that x is an odd number, find the possible values of x, which satisfy the Inequalities $x \geq 3$ **and** $5x - 10 < 35$ **(2)**

SIMPLIFY THE FOLLOWING

1. $\frac{a^2-b^2}{ab+a^2} \div \frac{ab-a^2}{2a^3}$ **(3)**

2. $\frac{x^3b^4}{a^4b^2c}$ **(2)**

3. $\frac{x^2-25}{x^2-2x-15}$ **(3)**

4. $\frac{x^2+7x+6}{x^2-36}$ **(3)**

5. $\frac{a^2x^3y-a^2x^3}{a^4a^2y-a^4x^2}$ **(3)**

6. $\frac{25-x^2}{10-2x}$ **(2)**

7. $\frac{n-3}{6} \div \frac{n^2-9}{4}$ **(2)**

8. $\frac{2x^2-5x-3}{x^2-9}$ **(3)**

9. $\frac{x-3}{3x^2-5x-12}$ **(2)**

10. $\frac{(-m)}{(-m)^2\times(-m)^2}$ **(3)**

11. $\frac{a^2-2a}{a^2-6a+9} \div \frac{4-2a}{a-3}$ **(3)**

COLUMN VECTORS

1. $A = (1;-3) AB = \binom{6}{8}$ $BC = \binom{2}{-2}$

$find$ (**a**) $/AB/$ **(2)**

(**b**) $/AC/$ **(2)**

(**c**) t$he\ coordinates\ of\ B$ **(2)**

2. $a = \binom{4}{2}$ $b = \binom{8}{5}$ $c = \binom{l}{12}$

$find\ (\boldsymbol{a}) b - a$ **(1)**

$(\boldsymbol{b}) /b - a/$ **(2)**

$(\boldsymbol{c})\ the\ value\ of\ l\ if\ /c/ = 13$ **(2)**

3. $A = (5,2)$ $B = (-3,8)$

$find\ (\boldsymbol{a}) AB\ as\ a\ column\ vector.$ **(1)**

$(\boldsymbol{b}) the\ length\ of\ line\ AB$ **(2)**

4. $AB = \binom{2}{4}$ $BC = \binom{-8}{6}$

$find\ (\boldsymbol{a})\ AC$ **(1)**

$(\boldsymbol{b}) /AC/\ leaving\ your\ answer\ in\ surd\ form.$ **(1)**

5. $P = (4;8)$ $R = (-4;-2)$

$find\ (\boldsymbol{a}) PR\ as\ a\ column\ vector$ **(1)**

$(\boldsymbol{b}) /PR/\ living\ your\ answer\ in\ surd\ form$ **(2)**

6. $OP = \binom{4}{3}$ $OQ = \binom{6}{-1}$

$Calculate\ (\boldsymbol{a}) /OP/$ **(2)**

$(\boldsymbol{b}) PQ$ **(2)**

$(\boldsymbol{c}) QP$ **(2)**

SINGLE FRACTION

Express as single fraction

1. $\frac{3}{x-2} - \frac{2}{x}$ **(3)**

2. $\frac{5m}{8} - \frac{2m+3}{4}$ **(3)**

3. $\frac{3}{x-2} - \frac{2}{x}$ **(2)**

4. $\frac{y}{4y-1} + \frac{3}{5}$ **(3)**

5. $\frac{4}{p} - \frac{3}{1-5p}$ **(3)**

6. $n + \frac{2n}{6n+5}$ **(3)**

7. $\frac{1}{x-1} + \frac{2}{x+1}$ **(3)**

8. $\frac{2a-5}{a-4} - \frac{1}{2}$ **(3)**

9. $\frac{2x-1}{3} - \frac{x-2}{4}$ **(3)**

10. $\frac{n}{5} + \frac{2n}{6n} + 5$ **(3)**

11. $\frac{1}{2x-5} + \frac{2}{3}$ **(3)**

12. $\frac{1}{x} + \frac{1}{2x}$ **(2)**

13. $\frac{x}{2} - \frac{x-1}{2}$ **(2)**

14. (i) Express $\frac{x}{3} + \frac{x-4}{5}$ as a single fraction in its simplest form.

(ii) Hence or otherwise solve the equation $\frac{x}{3} + \frac{x-4}{5} = 4$ **(4)**

GRADIENT

1. $A = (1, -2)$ $B = (3,4)$.

find (**a**) the gradient of AB **(1)**

(**b**) the equation of AB **(2)**

2. $A = (1,2)$ $P = (4, -2)$ lie on line Z

(**a**) find the gradient of line Z **(1)**

(**b**) find the equation of line Z **(2)**

3. A straight line joins the points A (1;3) and B (4;7).

a. What is the length of AB? **(1)**

b. What is the gradient of AB? **(2)**

c. A line parallel to AB passes through the origin and the point (3; k).What is the value of k? **(2)**

4. The equation of a straight line is given as 5x + 4y – 30=0.

a) Make y the subject of the equation. **(2)**

b) Write down the gradient of the straight line. **(1)**

c) Write down the coordinates of the point where the line crosses the x- axis. **(1)**

5. *P* is the point (–3, 4), *Q* is the point (5, 1).

(a) *M* is the midpoint of *PQ*. Find the coordinates of *M*. [1]

(b) Find the gradient of *PQ*. [1]

(c) *R* is the point (– 6, 0), *O* is the point (0, 0).

Which of the points, *R* or *P*, is closer to *O*?
Show your working. [2]

VARIATION

1. Its given that $C = a + KN^2$

Find the two possible values of N given that $C = 102, a = 27$ and $K = 3$ **(3)**

2. y varies directly as v and inversely as $(x + 2)$

(**i**)Express y in terms of v, x and a constant k **(2)**

(**ii**)Given that when $y = \frac{3}{2}, x = 8$ and $v = 5$, find the value of k **(2)**

(**iii**)Find y when $x = -11$ and $v = 2$ **(2)**

3. A is partly constant and partly varies as C

(**a**)Express A in terms of C and constant h and k **(1)**

(**b**)Given that $A = 1$ when $C = 8$ and that $A = 3$ when $C = 12$, calculate the value of:

(**i**) h **(2)**

(**ii**) k **(2)**

(**c**)Find the value of A when $C = 30$ **(2)**

4. Shumirai's weekly wage W (in thousands of dollas), is partly constant and partly varies as the numbers of hours N of overtime he works per week.

(**i**)Express W in terms of N and constants h and k **(1)**

(**ii**)Given that when $W = 80, N = 10$ and when $W = 60, N = 6$, find the value of h value of k. **(3)**

(iii) Shumirai's normal working time is 44 hours in a week.

Find the total number of hours worked in a week in which he was paid \$ 90 thousand. **(3)**

5. It is given that y varies directly as the square root of z

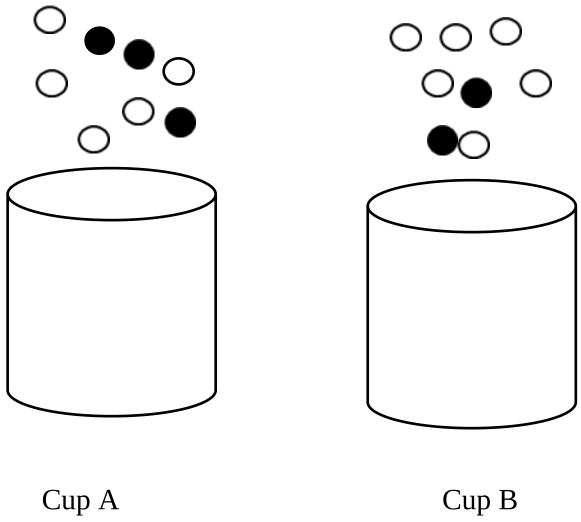
a) Write down the equation connecting y , z and a constant k.
b) Find k when y = 3 and z = 4
c) Find y when z = 16 **(6)**

6. It is given that w bis inversely proportional to f and when f = 20 , w = 150.

a) Find an equation connecting f and w
b) Find the value of f when w = 60 **(4)**

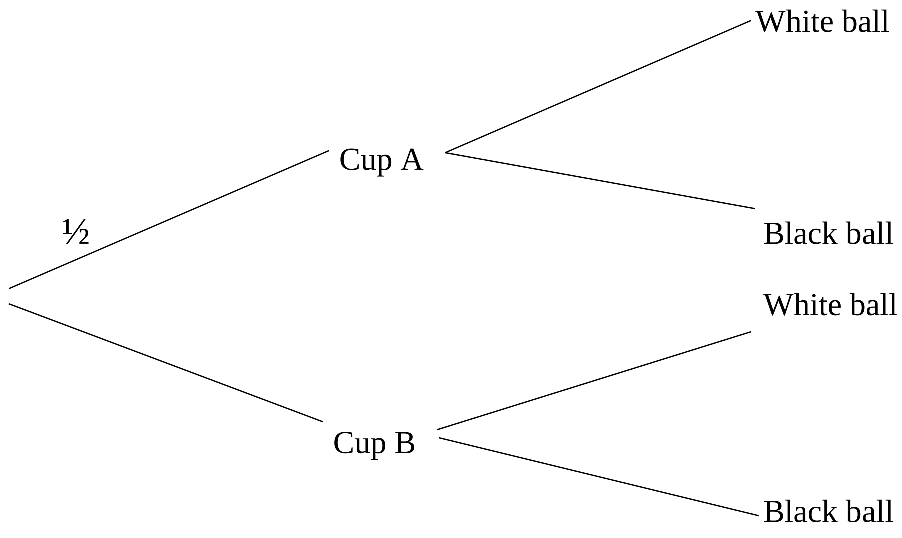
PROBABILITY

1.



Shumi must choose a cup from which he should pick a ball. The probability that he chooses cup A= ½

Cup A contains 5 white and 3 black balls. Cup B contains 6 white and 2 black balls. The tree diagram below shows some of this information.



a. Complete the probability tree diagram shown above **(2)**
b. Find the probability that Shumi chooses Cup A and then a white ball **(2)**
c. Find the probability that Shumi picks a white ball **(2)**

2. 9 white and 6 yellow identical tennis balls are placed in a box. Kuda picks balls at random one at a time.

Find the probability that the first and second balls picked are

i. both white
ii. of different colours (4)

3. A drama club has 15 members, 8 of whom are girls.

(i) Find the probability of randomly choosing a boy from the group.

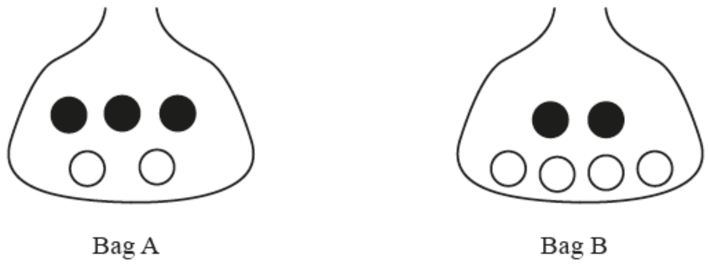
(ii) Six more members joined the club to bring the total membership to 21.

Given that the probability then of randomly choosing two girls, one after the other became $\frac{3}{14}$, find the number of new girls who joined the club. (4)

4. A bag contains 10 identical balls of which 3 are red, 1 is blue and 6 are green. Two balls are drawn at random, from the bag without replacement, one after the other. Calculate the probability that:

i. The first ball is green and the second is blue (2)
ii. Both balls are green (2)

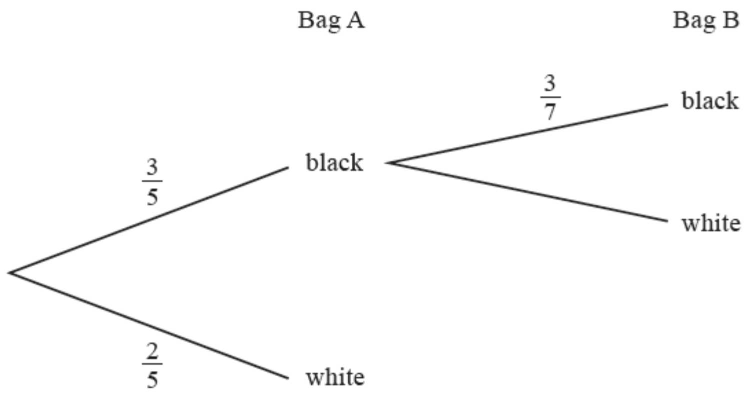
5.



Bag A contains 3 black and 2 white beads.
Bag B contains 2 black and 4 white beads.

A bead is chosen, at random, from Bag A and placed in Bag B.
A bead is then chosen, at random, from Bag B.

(a) Complete the tree diagram.

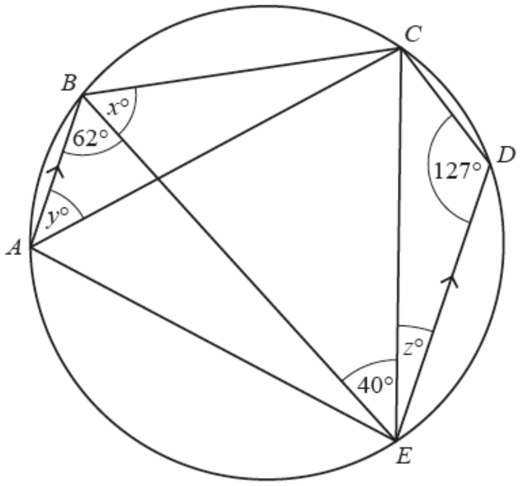


[2]

(b) Find the probability that a black bead is taken from Bag B.

Answer .... [2]

CIRCLE GEOMETRY



In the diagram, A, B, C, D and E lie on the circle.
AB is parallel to ED.
$A\hat{B}E = 62°$, $C\hat{D}E = 127°$ and $B\hat{E}C = 40°$.

(a) Find x.

Answer $x =$ .... [1]

(b) Find y.

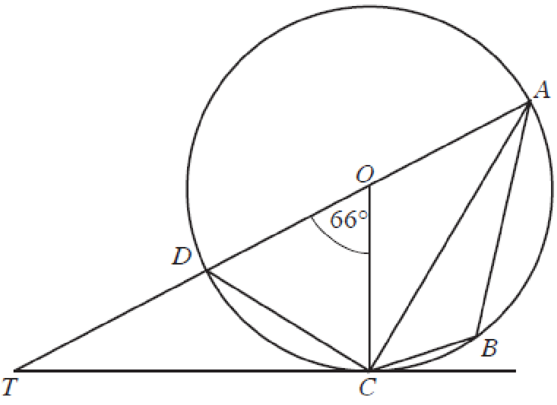
Answer $y =$ .... [1]

(c) Find z.

Answer $z =$ .... [1]

2.

In the diagram, A, B, C and D lie on a circle centre O.



The tangent to the circle at C meets the diameter AD produced, at T.

$D\hat{O}C = 66°$.

Calculate

(i) $D\hat{A}C$, [1]

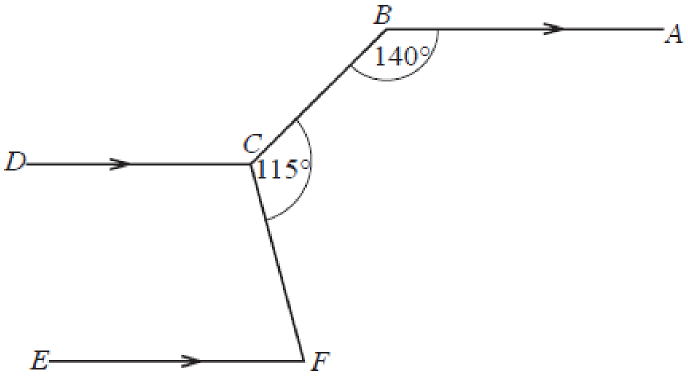
(ii) $D\hat{T}C$, [1]

(iii) $A\hat{D}C$, [1]

(iv) $A\hat{B}C$. [1]

3.

In the diagram, the lines BA, DC and EF are parallel.
$A\hat{B}C = 140°$ and $B\hat{C}F = 115°$.



Find

(a) $D\hat{C}B$,

(b) $D\hat{C}F$,

(c) $E\hat{F}C$.

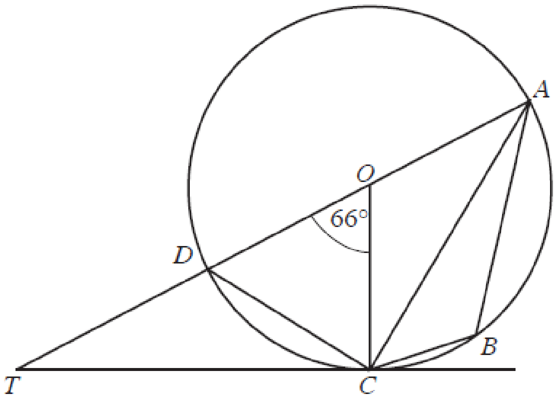
Answer (*a*) $D\hat{C}B$ = ...[1]

(*b*) $D\hat{C}F$ = ...[1]

(*c*) $E\hat{F}C$ = ...[1]

4.

In the diagram, A, B, C and D lie on a circle centre O.



The tangent to the circle at C meets the diameter AD produced, at T.

$D\hat{O}C = 66°$.

Calculate

(i) $D\hat{A}C$, [1]

(ii) $D\hat{T}C$, [1]

(iii) $A\hat{D}C$, [1]

(iv) $A\hat{B}C$. [1]

TRANSFORMATION

1. Answer the whole of this questionon a sheet of graph paper. Use a scale of 2cm to 1unit on both axes,from x= - 4 to x = 6. Triangle ABC has vertices at A (1; 1), B (3;1) and C (2;3).

(a) (i) Draw and label triangle ABC. [1]

(ii) Triangle ABC is mapped onto triangle $A_1B_1C_1$ by transformation represented by the matrix $\begin{pmatrix} 1 & 0 \\ 2 & 1 \end{pmatrix}$.

Draw and label triangle $A_1B_1C_1$. [3]

(i) An enlargement of factor $-1\frac{1}{2}$, centre (0;0) maps triangle ABC onto triangle $A_2B_2C_2$.
Draw and label triangle $A_2B_2C_2$. [3]

(b) (i) Describe completely the transformation represented by matrix $\begin{pmatrix} 1 & 0 \\ 2 & 1 \end{pmatrix}$ in **(a)(ii).** [3]

(ii) Write down the matrix that represents the enlargement in (a) (iii). [1]

(c) A translation $\binom{3}{-4}$ maps point B onto point B_3.

Write down the coordinates of point B_3. [1]

2. Answer the whole of this questionon a sheet of graph paper. Use a scale of 2cm to 2units on both axes,from x= - 4 to x = 12.

a. $\Delta\ A_1B_1C_1$ has vertices at A_2 (-2; 2), B_2 (1; 2), C_2 (10; 6) and Δ ABC has vertices at A (-6; 2), B (-3; 2), C_2 (-2; 6).

i. Draw and label clearly $\Delta\ A_1B_1C_1$,
ii. Draw and label clearly Δ ABC
iii. Describe fully the single transformation which maps $\Delta\ A_1B_1C_1$ onto Δ ABC. [5]

b. $\Delta\ A_2B_2C_2$ is the image of Δ ABC under a one way stretch of factor -2 with the x-axis invariant.

Draw and label triangle $A_2B_2C_2$. [2]

c. i. N is a transformation represented by $\begin{pmatrix} -2 & 0 \\ 0 & -2 \end{pmatrix}$

Draw and label clearly $\Delta\ A_3B_3C_3$, the image of Δ ABC under the transformation N.

ii. Describe fully the single transformation which maps Δ ABC onto $\Delta\ A_3B_3C_3$ [5]

3. Answer the whole of the question on a sheet of graph paper.

Triangle W has vertices at (1 ; 1), (7 ; -1) and (4 ; 4). Using a scale of 2cm to represent 2 units on both axes , draw the x and y-axes for $-10 \leq x \leq 10$ and $-10 \leq y \leq 10$.

1. Draw and label clearly triange W. **(1)**
2. Triangle X is the image of triangle W under a reflection in the line y = x+2.

   Draw and label clearly,

   i. The line y = x + 2

   ii. Triangle X **(3)**

3. (i) Draw and label clearly triangle Y, the image of triangle W under an enlargement of scale factor $-\frac{1}{2}$ with the origin as the centre.

   (ii) Write down the matrix which represents this transformation. **(4)**

4. Triangle Z with vertices at (1 ; -3), (1 ;-9) and (6; -6), is the image of triangle W under a certain transformeation.

   i. Draw and label clearly triangle Z.

   ii. Describe **fully**the **single** transformation which maps triangle W onto triangle Z.

(4)

FUNCTIONAL GRAPHS

1. The following is an incomplete table of values for the function $y = \frac{1}{5}(3\text{-}2x - x^2)$.

x	-4	-3	-2	-1	0	1	2	3
y	-1	0	0,6	0,8	0,6	0	-1	P

(a) Calculate the value of p. [1]

(b) Use a scale of 2cm to 1unit on the x-axis and 2cm to 0,5 units on the y-axis. Draw the graph of $y = \frac{1}{5}(3\text{-}\ 2x\text{-}x^2)$. [4]

(c) By drawing a suitable tangent, estimate the gradient of the curve at $x = 0$. [2]

(d) Use the graph to

i. Solve the equation $\frac{1}{5}(3\text{-}\ 2x - x^2) = \text{-}0{,}5$ [3]

ii. Find an estimate of the area bounded by the x-axis and the curve. [2]

2. The following is an incomplete table of values for the function $y = x^2 - 5x + 3$

x	-3	-2	-1	0	1	2	3
y	-9	m	7	3	-1	1	n

a. Calculate the value of m and n. [2]

b. Use a scale of 2cm to represent 1unit on the x-axis and 2cm to 5 units on the y-axis. Draw the graph of $y = x^2 - 5x + 3$ [4]

c. On the same axis, draw the line y = x+3. [2]

d. Write down the roots of the equation $y = x^2 - 5x + 3 = x + 3$. [3]

e. Use your graph to estimate the gradient of the curve $y = x^2 - 5x + 3$ at the point where x=2. [2]

3. The following is an incomplete table of values for y =$2x^2$ – 5x –3.

x	-2	-1	$-\frac{1}{2}$	0	1	2	3	4
y	15	4	p	-3	-6	q	0	9

a. Calculate the value of p and the value of q. (2)

b. Using a horizontal scale of 2 cm to represent 1 unit and a vertical scale of 2cm to represent 2 units.

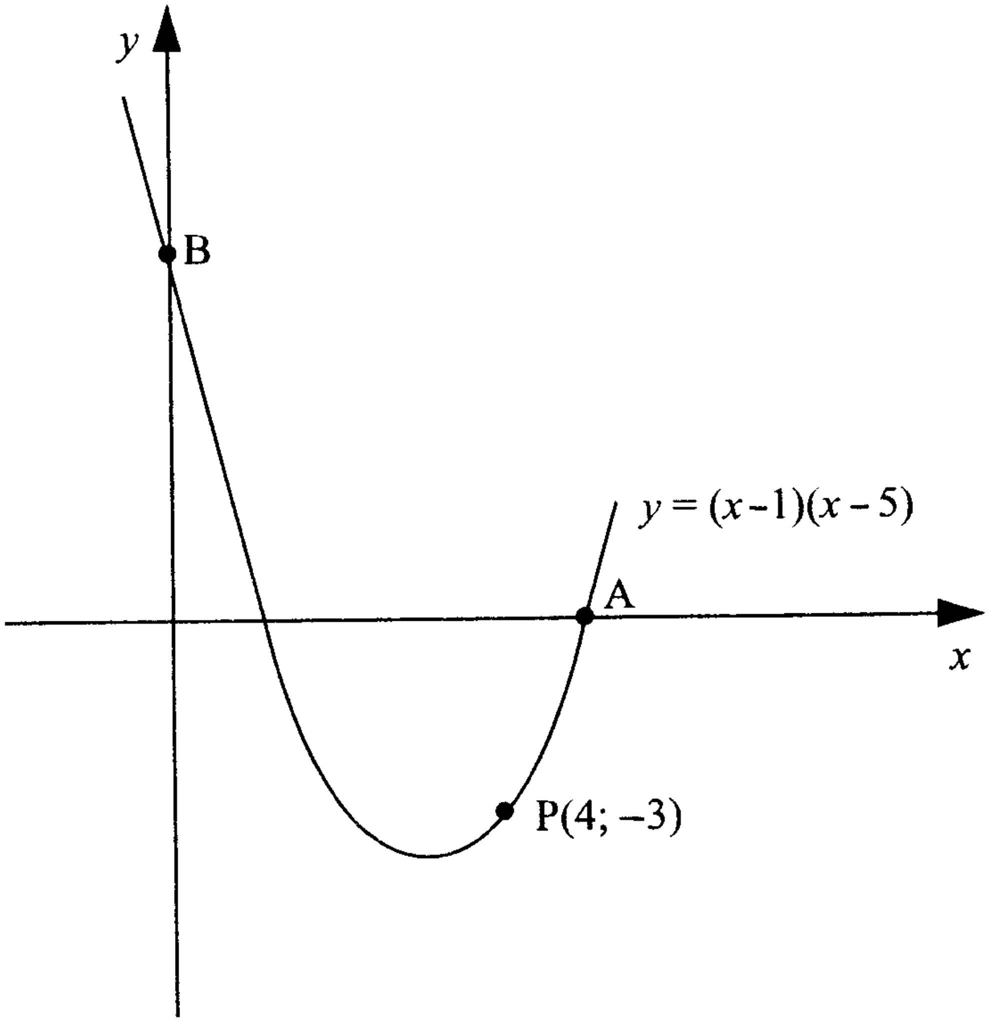
Draw the graph of y =$2x^2$ – 5x – 3 for -2 ≤ x ≥4 and -8 ≤ y ≥ 16. (4)

c. Find the gradient of the curve when x = 1. (2)

d. Use your graph to solve the equation $2x^2$ – 5x – 3 = - 4 (2)

e. find the area bounded by the curve and the x-axis from x = 1 to x = 3 (2)

4.



The diagram shows the graph of y = $(x - 1)(x - 5)$.

(a) Find the coordinates of

(i) A [1]

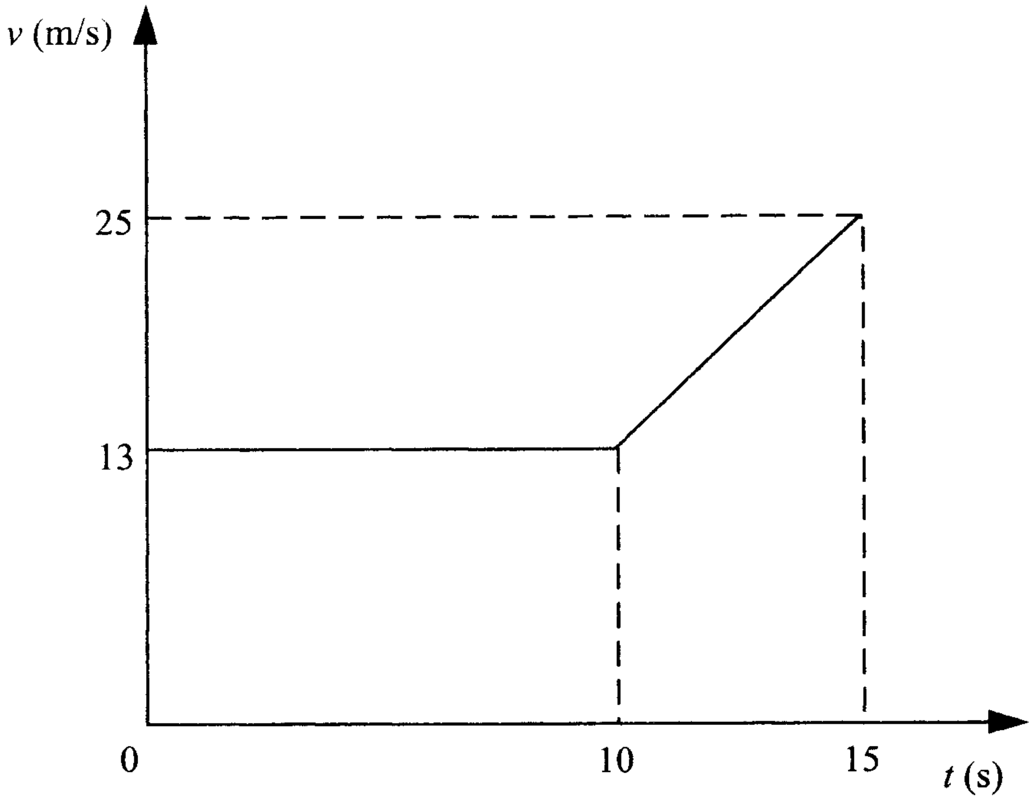
(ii) B [1]

(b) Given that P (4;-3) lies on the curve, calculate the gradient of a straight line passing through B and P. [1]

(c) Find, in the form y = mx + c, the equation of the line parallel to PB passing through A. [2]

TRAVEL GRAPHS

1.



The diagram shows the velocity-time graph of a car. The car has an intial velocity of 13m/s and maintains this velocity for 10 seconds after which it accelerates uniformly until it reaches a velocity of 25m/s in a further 5 seconds.

Calculate

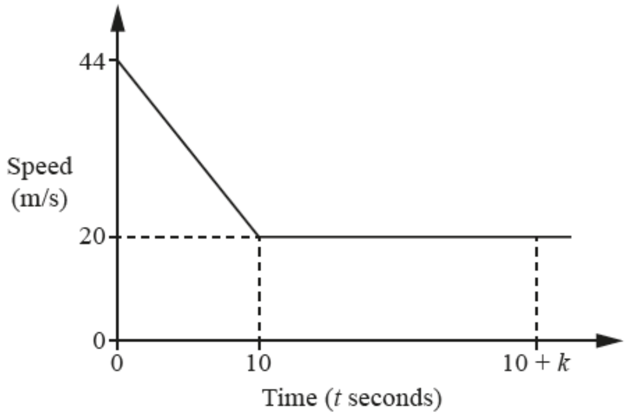
(a) the acceleration from t = 10 to t = 15. [1]

(b) the velocity when t = 13, [2]

(c) the distance travelled by the car between t = 5 and t = 15. [3]

2.

The diagram is the speed–time graph of part of a train's journey.



The train slows down uniformly from a speed of 44 m/s to a speed of 20 m/s in a time of 10 seconds.
It then continues at a constant speed of 20 m/s.

(a) Find the deceleration when $t = 5$.

Answer .... m/s^2 [1]

(b) Find the speed when $t = 5$.

Answer .... m/s [1]

(c) The distance travelled from $t = 0$ to $t = 10$ is equal to the distance travelled from $t = 10$ to $t = 10 + k$.

Find k.

3. **(a)** A car decelerates uniformly from 20 m/s to 5 m/s in 25 seconds.
Calculate the retardation. [1]

(b) Express 20 metres per second in kilometres per hour. [1]

LINEAR PROGRAMMING

1. A luxury bus has 100 units of seating area. There are two types of seats, Ordinary and First Class.

   Let the number of Ordinary seats be x and First Class seats be y.

   (a) Ordinary seats take up 1 unit of seating area and First Class seats take up 1,5 units of seating area.

   Form an inequality which satisfies this condition and show that it reduces to

   $2x + 3y \leq 200$. [2]

   (b) There must be at least 10 First Class seats.

   Write down an inequality which satisfies this condition. [1]

   (c) There must also be at least twice as many Ordinary seats as First Class seats.

   Write down an inequality which satisfies this condition. [1]

   (d) The point (x; y) represents x Ordinary seats and y First Class seats.

   Draw the graphs of the inequalities in

   1. (a), [1]
   2. (b), [1]
   3. (c). [1]

   (e) Show, by shading the **unwanted** regions, the region in which (x; y) must lie. [2]

   (f) A luxury bus company which uses this type of luxury bus charges \$15 for each Ordinary seat and \$25 for each First Class seat for a certain trip.

   Use the graph to find the greatest possible amount of money that the company would receive from this trip. [3]

2. A newly constructed school wishes to buy desks and chairs for its learners.

Let x be the number of desks and y the number of chairs.

a. i. The school wishes to buy at least 75 desks and at least 100 chairs.

Write down two inequalities which satisfy these conditions.

ii. The number of chairs should be more than the number of desks.

Write down an inequality which satiesfies this condition.

iii. Desks cost $25 each and chairs cost $17.50 each. The school has only $5 000 to spend on these items.

Write down an inequality and show that it reduces to $10x + 7y = 2\ 000$. [5]

b. Using a scale of 2cm to represent 25desks and 2cm to represent 50chairs, show by shading the unwanted regions, the region in which (x; y) must lie. [5]

c. Use your region to determine the number of desks and chairs that would use up the greatest possible amount. [2]

STATISTICS

1. For the numbers 3;5;4;2;7;3;11

Find **(i)** the mode **(1)**

(ii) the median **(1)**

(iii) the mean **(2)**

2. The numbers 4;7;8;k;10;11;14;18 are in ascending order :

(a) Given that the mode is 8, find the value of k **(1)**

(b) Hence; find the

(i) median **(1)**

(ii) mean **(2)**

3. The following entries show the numbers of bicycles sold per day in nine days s

6;10;12;9;14;10;15;10;12

Find **(a)** the mode **(1)**

(b) the median **(1)**

(c) the next entry if the new mean on the tenth day is 12 **(2)**

4. The diagram below show some students who walk to school each day.

Distance in km	1	2	3	4	5
Frequency	4	2	2	1	1

Find

a. The number of students who walk to school. **(2)**
b. The mode **(1)**
c. The median **(1)**
d. The mean **(3)**

5. The table shows the number of passengers in each of 50 taxis leaving airport one day.

Number of passengers	1	2	3	4
Number of taxis	x	20	y	13

(a) Find the value of x + y in its simplest form.

(b) If the mean number of passengers per taxi is 2,66 ; show that x + 3y = 41.

(c) Find the value of x and the value of y by solving appropriate equations. (8)

6. The table shows the number of books borrowed from Power library in one week.

Subject	Geography	Science	Maths	English	Commerce
Number of books	30	45	25	20	60

a) Find the total number of books borrowed in that week. (2)

b) Express the total number of Commerce books as a fraction of all the books borrowed in its lowest terms. (2)

c) Show this information on a clearly labelled pie-chart. (6)

d) Two students borrowed books from the library during that week.

Calculate the probability that the first student borrowed a Science book and the second a Maths book. (2)

7. The diagram below shows the distribution of marks of students in a class.

Class	1-5	6-10	11-15	16-20	21- 25
Frequency	2	4	7	5	2

(a) How many students are in the class. [2]

(b) State the modal class. [1]

(c) Calculate the mean. [3]

(d) There are 49 students in a class. Given that the probability of picking a girl from the class is $\frac{4}{7}$. Find the number of boys. [3]

(e) Evaluate $log_{\,7}7^{-2} – log_{\,5}\frac{1}{5}$ [3]

8. The heights of 40 children were measured. The results are summarised in the table below.

Height (h cm)	$105 < h \leq 115$	$115 < h \leq 125$	$125 < h \leq 135$	$135 < h \leq 155$
Frequency	5	10	20	5

(a) (i) Identify the modal class. [1]

(ii) Calculate an estimate of the mean height. [3]

(b) Draw the cumulative frequency curve, using a scale of 2cm to represent 10units on both axis. [4]

(c) Use the curve to find

(i) the interquartile range, [2]

(ii) the number of children whose heights are in the range 120 cm to 130 cm. [2]

9. Forty pupils took part in a race and the distances to the nearest metre, that they coverd in a certain time interval, are given in the frequency table below.

Distance (metres)	$10 \leq x < 20$	$20 \leq x < 50$	$50 \leq x < 60$	$60 \leq x < 70$	$70 \leq x < 80$	$80 \leq x < 100$
Frequency (f)	4	6	8	4	13	5
Frequency density	0.4	a	0.8	b	c	0.25

i. State the modal class **(1)**

ii. If the information is to be represented on a histogram, find the values of a , b and c. **(3)**

iii. Calculate the mean distance covered **(3)**

iv. Two of the pupils are selected at random to make a report on the race.
Find the probability that both pupils had covered 70m or more in the race. **(2)**

The heights of 40 children were measured.
The results are summarised in the table below.

Height (h cm)	$105 < h \leqslant 115$	$115 < h \leqslant 125$	$125 < h \leqslant 135$	$135 < h \leqslant 145$
Frequency	5	10	20	5

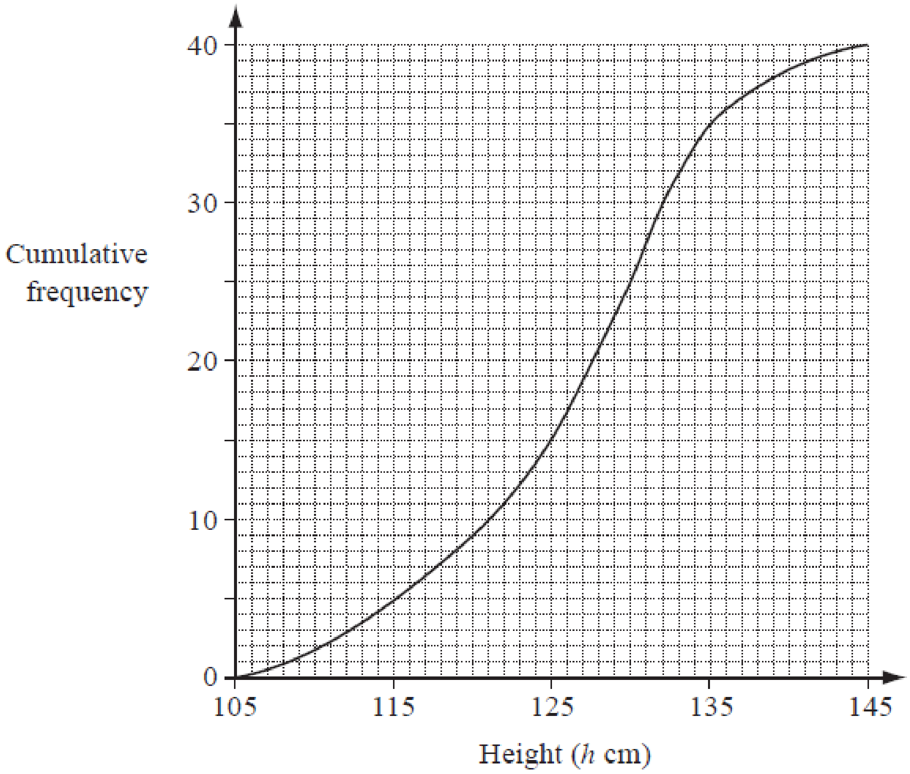
(a) **(i)** Identify the modal class.

(ii) Calculate an estimate of the mean height.

Answer (*a*)(i) ....[1]

(ii) ....cm [3]

(b) The cumulative frequency curve representing this information is shown below.



Use the curve to find

(i) the interquartile range,

(ii) the number of children whose heights are in the range 120 cm to 130 cm.

Answer (*b*)(i) ....cm [2]

(ii) ....[1]

CONSTRUCTION

Answer the following questions on sheets of plain paper

Use ruler and compasses only
All the construction lines must be clearly shown

1.a) Construct, on a single diagram,

i. the triangle ABC in which AB =6,8 cm, BC = 10 cm and ABC = 120° (2)

ii. the perpendicular from A on to CB produced, (2)

iii. the locus of points which are 3cm from BC, (2)

iv. the bisector of angle ABC. (2)

b) i. Measure and write down the length of AC. (1)

ii. Mark two points X and Y which are 3cm from BC and are equidistant from AB and BC (2)

2. All constructions should be on a single diagram.

(a) i. Line VW = 12cm. Mark a point X on VW such that VX = 8 cm.

ii. Construct a perpendicular to VW passing through point X. (3)

(b) i. Mark points Y and Z on the perpendicular such that XZ= XY=5,5 cm. (1)

(c) i. Draw lines VZ, VY, WZ and WY.

ii. Hence state the name of the quadrilateral VYWZ. (2)

(d) Describe fully the locus of points equidistant from V and Y. (1)

(e) i. Construct the locus of points equidistant from V and Y.

ii. Hence draw a circle that passes through V ,X and Y.

iii. measure and write down the radius of the circle. (4)

SETS

1. In an ordinary level examination, each of 124 candidates sat for the Mathematics, English and Science examinations. 9 candidates passed Mathematics only, 15 passed English only and 10 more candidates than those who passed all three subjects passed Science only. Given that 28 passsed Mathematics and Science, 32 passed Mathematics and English, 30 passed English and Science and that 27 candidates did not pass any of the three subjects, find the

(i) Number of candidates who passed all the three subject, [1]

(ii) Number of candidates who passed Science, [1]

(iii) Percentage pass rate for Mathematics among these candidates correct to 1 decimal place. [2]

2. lt is given that $\sum = S\{1; 2; 3; \ldots .8; 9; 10\}$,with subsets A and B such that A is a set of perfect squares and B is a set of multiples of 3.

(a) Draw a venn diagram to represent the sets above.
(b) Find n($A \cup B$) **(4)**

3. In a group of 35 people,
22 are wearing spectacles,
10 are wearing a hat,
6 are wearing spectacles and a hat.

By drawing a Venn diagram, or otherwise, find the number of people who are wearing neither spectacles nor a hat. [4]

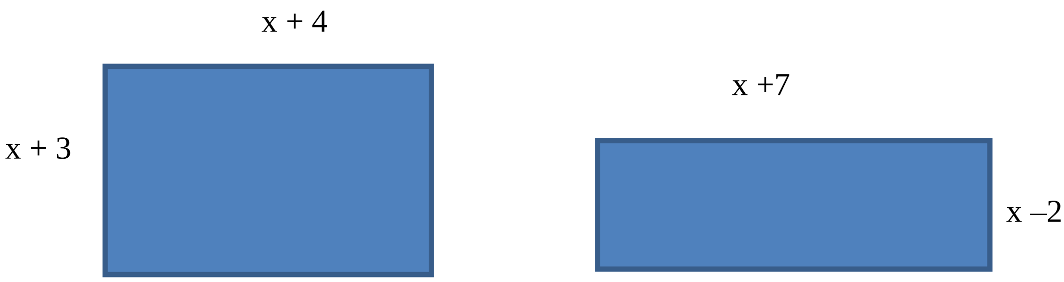
4. In a class of 40, every student studies at least one of the subjects Commerce, Business Enterprise and Accounts.

4 students study Commerce and Business Enterprise,
5 study Commerce and Accounts,
7 study Business Enterprise and Accounts,
15 study Commerce only,
13 study Business Enterprise only and
4 study Accounts only.

Find the number of pupils who study all the three subjects. [5]

SHOW THAT & BULLDOZER

1. The rectangle on the left is twice the area of that on the right.



a. Form a quadratic equation in x and show that it reduces to $x^2 + 3x - 40 = 0$. **(4)**

b. Solve the equation, stating which solution is realistic in terms of the given data. **(6)**

c. Find the area of the larger rectangle. **(2)**

2. Solve the equation $2x^2 - 4x - 3 = 0$, giving your answers correct to one decimal place. **(5)**

3. Solve the equation $3x^2 - 5x - 15 = 0$, giving your answers correct t o 2 decimal places. **(5)**

4. (a) Given that $2^{2\,(x^2-3)} \times 2^{3x} = 16$ show that it can be reduced to $2x^2 + 3x - 10 = 0$ **(3)**

(b) ***S***olve $2x^2 + 3x - 10 = 0$ giving your answers correct to 2 decimal places**(5)**

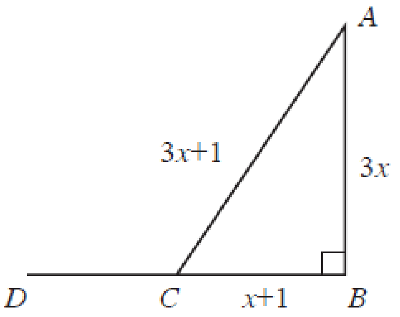
5.a Show that the equation $\frac{1}{2x-5} + \frac{2}{3} = \frac{1}{x+3}$ reduces to $4x^2 - x - 6 = 0$. **(3)**

b. Solve the equation $4x^2 - x - 6 = 0$ giving your answer correct to two decimal places. **(5)**

6 (a) Show that the equation $\frac{6x}{5} + \frac{5}{x} = 3x$ reduces to $9x^2 - 25 = 0$. [3]

(b) Solve the equation $9x^2 - 25 = 0$. [3]

7.



In the triangle ABC, $A\hat{B}C = 90°$, $AB = 3x$ cm, $BC = (x+1)$ cm and $AC = (3x+1)$ cm.

(i) Form an equation in x and show that it reduces to $x^2 - 4x = 0$.

Answer (b)(i) ....

....

....

....

....

....[2]

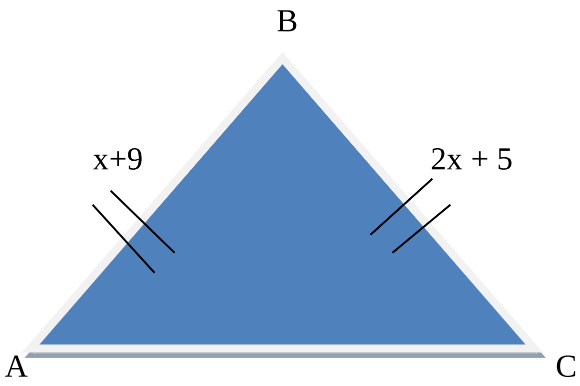
(ii) Find the value of x.

(iii) Given that BCD is a straight line, state the numerical value of $\cos D\hat{C}A$.

Answer (b) (ii) $x =$ ....[1]

(iii) ....[1]

8.



In the diagram, ABC is an isosceles triangle with AB = BC.

AB = (x + 9) cm, BC = (2x + 5) cm and the base, AC =10cm.

i. Form an equation in terms of x and solve it. **(3)**

ii. Write down the length of AB. **(1)**

iii. Calculate the area of the triangle ABC. **(2)**

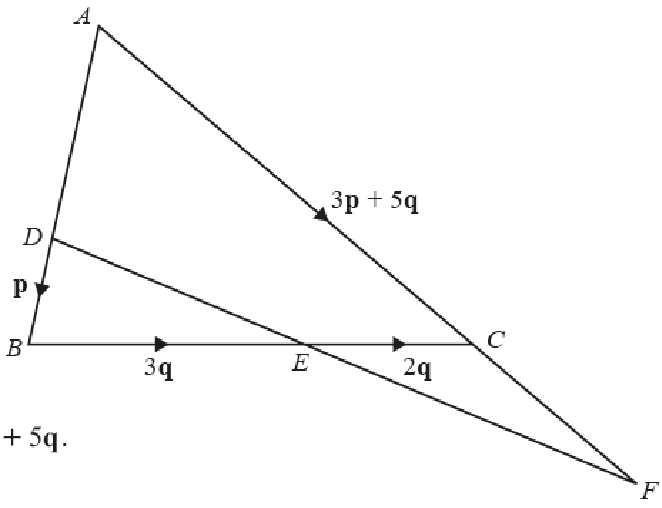
iv. Given that all the lengths of the sides of Δ ABC were given to the nearest centimetre, calculate the least possible perimeter of the triangle. **(3)**

VECTORS

1.

In the diagram, ADB and ACF are straight lines.

BC intersects DF at E.



$AC : CF = 2 : 1$.

$\overrightarrow{DB} = \mathbf{p}$, $\overrightarrow{BE} = 3\mathbf{q}$, $\overrightarrow{EC} = 2\mathbf{q}$ and $\overrightarrow{AC} = 3\mathbf{p} + 5\mathbf{q}$.

(a) Express $\overrightarrow{AB}$ in terms of $\mathbf{p}$.

Answer $\overrightarrow{AB} =$ .... [1]

(b) Express $\overrightarrow{CF}$ in terms of $\mathbf{p}$ and/or $\mathbf{q}$.

Answer $\overrightarrow{CF} =$ .... [1]

(c) Express $\overrightarrow{EF}$ in terms of $\mathbf{p}$ and/or $\mathbf{q}$.

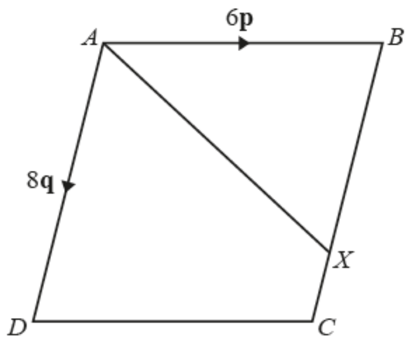
Answer $\overrightarrow{EF} =$ .... [1]

(d) $\overrightarrow{EF} = k\overrightarrow{DE}$.

Find k.

Answer $k =$ .... [2]

2.



In the diagram, $ABCD$ is a parallelogram.
X is the point on BC such that $BX : XC = 3 : 1$.
$\overrightarrow{AB} = 6\mathbf{p}$ and $\overrightarrow{AD} = 8\mathbf{q}$.

(a) Express $\overrightarrow{BX}$ in terms of **p** and/or **q**.

Answer .... [1]

(b) Express $\overrightarrow{AX}$ in terms of **p** and/or **q**.

Answer .... [1]

(c) Y is the point such that $\overrightarrow{CY} = 3\mathbf{p} + \mathbf{q}$.

(i) Express $\overrightarrow{AY}$ in terms of **p** and/or **q**.

Answer .... [1]

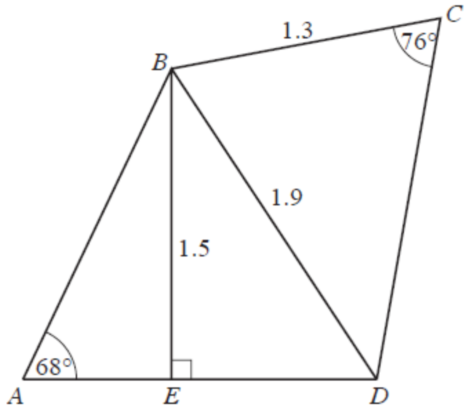
(ii) Find the ratio $AX : AY$.

Answer .... : .... [1]

TRIGONOMETRICAL RATIOS

The diagram represents a framework.

$BC = 1.3$ m, $BD = 1.9$ m and $BE = 1.5$ m.
$B\hat{C}D = 76°$, $B\hat{A}E = 68°$ and $B\hat{E}D = 90°$.



Calculate

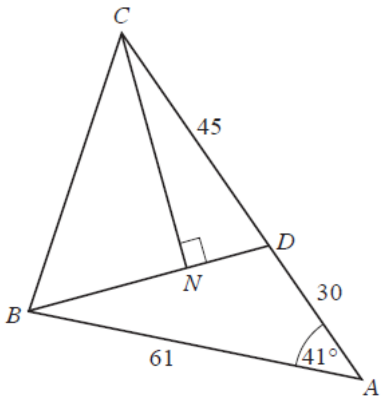
(a) $D\hat{B}E$, [2]

(b) AE, [2]

(c) $B\hat{D}C$. [3]

SOLVING TRIANGLES

Diagram I



In Diagram I, the point D lies on AC and N is the foot of the perpendicular from C to BD.
$AB = 61\,\text{m}$, $AD = 30\,\text{m}$ and $DC = 45\,\text{m}$.
Angle $BAC = 41°$.

(a) Calculate BD. [4]

(b) Show that, correct to the nearest square metre, the area of triangle BDA is $600\,\text{m}^2$. [2]

(c) Explain why $\dfrac{\text{area of } \Delta BCD}{\text{area of } \Delta BDA} = \dfrac{3}{2}$. [1]

(d) Calculate the area of triangle BCD. [1]

(e) Hence calculate CN. [2]

FURTHER PRACTICE

1. At Power High School, 15% of the total enrolment transferred due to transport costs and 40% of the remainder transferred due to increases in school levies. If there were only 612 students left, calculate the enrolment of the school before the students transferred. **(3)**

2. Mrs Musendo decides to erect a durawall around her rectangular stand measuring 20m by 11m. Three metres are to be left for a gate.

a. Find the perimeter of the durawall. **(3)**

She has two options, A or B, to consider for erecting the durawall.

Option A

She could engage a contractor who charges $12 per metre on a fix and supply basis.

b. Calculate the total cost of erecting the durawall using option A. **(2)**

Option B

She could buy the following materials as shown in the table below and engage a builder who charges $100 for the job.

Item	**Quantity**	**Cost per unit**
Bricks	5 000	$80,00 for 1 000
Cement	10 x 50 kg bags	$10 per bag
Brick force	5 bundles	$5 per bundle
Pint sand	2 loads	$30 per load

c. Calculate the total cost of erecting the durawall using option B. **(3)**

d. Mrs Musendo decides to use the cheaper option. Calculate the amount she saves by using that option. **(2)**

3. A school clerk works from 0800 to 1200 in the mornings and from 1300 to 1630 in the afternoons. If the rate of pay is $2,40 per hour, calculate

a. the weekly wage of the clerk **(3)**
b. the annual pay of the clerk **(2)**

4. Find how much $343,20 amounts to in 3 years at $12\frac{1}{2}$%. **(3)**

5. A man walked 12 km at 3km/h and cycled 18km at 9km/h. What was his average speed for the whole journey?

6. The trapezium PQRS , in which QR is parallel to PS, is such that PS= 11cm, PQ = 5cm and QPS = 90°. If the area of the trapezium is $45cm^2$, Find the length of QR. **(3)**

7. A rural district council increases the value of land by 5% every year. If the value of a piece of land is $4 600, calculate its value in 2 years' time. **(3)**

8. (a) 200 grams of a spice cost 85 cents.
Find the cost, in dollars, of 1 kilogram of this spice. [1]

(b) You are given that 60 : x = 3 : 2. Find x. [1]

9. The table shows the fares charged by a taxi company.
$1.20 per kilometre for the first 10 km then
80 cents for each additional kilometre after the first 10 km

(a) Calculate the fare for a journey of
(i) 8 km, [1]
(ii) 24 km. [1]
(b) Find the length of the journey for which the fare was $16. [2]

10. (a) On Monday, two girls, Jane and Susan, collected some seashells.
Jane collected x shells and Susan collected 22 **more** than Jane.
On Tuesday, Susan gave 60 of her shells to Jane.
The table shows the numbers of shells each girl had on the two days.

	Jane	*Susan*
Monday	x	$x + 22$
Tuesday	$x + 60$	y

(i) Write down an expression for y in terms of x. [1]
(ii) Given that, on Tuesday, Jane had three times as many shells as Susan,write down and solve an equation in x, [2]
(b) Find the total number of shells the girls collected. [1]

11. (a) Express 154 as the product of its prime factors. [1]
(b) Find the lowest common multiple of 154 and 49. [1]

12. (a) Calculate 5% of $280 000. [1]
(b) A single carton of juice costs $4.20.
A special offer pack of 3 cartons costs $9.45.
Ali bought a special offer pack instead of 3 single cartons.

Calculate his percentage saving. [2]

13. The plan of a field has a scale of 1 cm to 5 metres.
Express this scale in the form 1 : n. [1]