

Mid Year Examination Paper 1

INSTRUCTION TO CANDIDATES:

1. Answer **all** questions.
2. Write your answers and working in the spaces provided.
3. Omission of essential working will result in loss of marks.
4. Calculators may be used in this paper.
5. If the degree of accuracy is not specified in the question, and if the answer is not exact, give the answer correct to three significant figures. Give answers in degrees correct to one decimal place.

Marks Obtained
50

- 1** From the following list of numbers given, write down

$$-5, \sqrt{2}, \pi, \frac{2}{5}, \sqrt{36}, 0.\dot{1}\dot{6}$$

- (a) two numbers that are **integers**,
- (b) two numbers that are **irrational numbers**.

Ans: (a) _____, _____ [2]

(b) _____, _____ [2]

- 2** Arrange the following numbers in descending order:

$$\frac{2}{7}, -3.5, -3, 0$$

Ans: _____, _____, _____, _____ [2]

- 3** Express, correct to 2 significant figures,

- (a) 668.78,
- (b) 0.01965.

Ans: (a) _____ [1]

(b) _____ [1]

- 4 Find the HCF and LCM of the two numbers $2^4 \times 11^6 \times 19^5$ and $2^2 \times 11^3 \times 17^4$, giving your answer in **index notation**.

Ans: HCF = _____ [1]

LCM = _____ [1]

- 5 Given that $2205 = 3^x \times 5^y \times 7^z$, find the values of x , y and z .

Ans: $x = \text{_____}$, $y = \text{_____}$, $z = \text{_____}$ [3]

- 6 (a) Find the difference between $m - 3n$ and $4m + n + 7$, given that $m - 3n$ is the larger number.
(b) Add $2p + 7$ to the product of 3 and $(4 - p)$.

Ans: (a) _____ [1]

(b) _____ [2]

- 7** The price of a wallet is \$30 more than the price of a belt. The total price of 3 wallets and 2 belts is \$290. Find the price of a wallet.

Ans: \$ _____ [3]

- 8** (a) Simplify $3(x - 4) - (7 - x)$.
(b) Subtract $7x - 2y + z$ from $3x + 9y + 2z$.

Ans: (a) _____ [2]

(b) _____ [2]

- 9** Write down the next two terms of the following number sequences.

(a) $-4, -1, 2, 5, \text{_____}, \text{_____}$

(b) $1, 4, 9, 16, \text{_____}, \text{_____}$

Ans: (a) _____, _____ [1]

(b) _____, _____ [1]

10 Solve the following equations.

(a) $x = 6 + 4x$

(b) $7(p - 6) = 3p$

Ans: (a) $x =$ _____ [2]

(b) $p =$ _____ [3]

11 Sam bought 3 books at $\$p$ each, 2 bags at $\$q$ each and has $\$(5p - q)$ left.

(a) How much did Sam spend?

(b) How much did Sam have at first?

Ans: (a) $\$$ _____ [1]

(b) $\$$ _____ [2]

12 The general term of a number sequence is given by $T_n = -2n + 3$. Find

(a) the 10th term,

(b) the term which has a value of -27 .

Ans: (a) _____ [1]

(b) _____ [2]

- 13** (a) Evaluate $\frac{\sqrt{95}-3^2}{65-2.3}$ and round off the answer to 3 significant figures.
(b) Estimate the value of $\sqrt{65} - (3.99 + 0.95)$, without the use of a calculator.

Ans: (a) _____ [2]

(b) _____ [2]

- 14** The parking charges for a car park is as follows:

- \$1.50 for the first hour
- 2 cents for every subsequent minute

How much is a driver charged if he parks for $2\frac{1}{2}$ h?

Ans: \$ _____ [2]

- 15** Tom's father is 21 years older than Tom. In three years' time, Tom's father will be thrice as old as Tom then. What is Tom's age now?

Ans: _____ years old [3]

16 Given that $v = 26$, $u = -7$ and $t = 3$, find the value of a in the formula $a = \frac{v-u}{t}$.

Ans: $a =$ _____ [2]

17 The length and breadth of a rectangle are $3x$ cm and y m respectively.

Find, in terms of x and/or y ,

- (a) the breadth in centimetres,
- (b) the area of the rectangle,
- (c) the perimeter of the rectangle.

Ans: (a) _____ cm [1]

(b) _____ cm² [1]

(c) _____ cm [1]

Solutions to:

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1. (a) $-5, \sqrt{36}$

(b) $\sqrt{2}, \pi$

2. $\frac{2}{7}, 0, -3, -3.5$

3. (a) 670

(b) 0.020

4.
$$\frac{2^4 \times 11^6 \times 19^5}{2^2 \times 11^3 \times 17^4}$$

HCF = $2^2 \times 11^3$

LCM = $2^4 \times 11^6 \times 17^4 \times 19^5$

5.
$$\begin{array}{r} 3 \overline{) 2205} \\ \underline{3} \\ 735 \\ \underline{5} \\ 245 \\ \underline{7} \\ 49 \\ \underline{7} \\ 7 \\ \underline{7} \\ 1 \end{array}$$

$\therefore 2205 = 3^2 \times 5^1 \times 7^2$

$x = 2, y = 1, z = 2$

6. (a) Difference = $(m - 3n) - (4m + n + 7)$

$= m - 3n - 4m - n - 7$

$= -3m - 4n - 7$

(b) $(2p + 7) + (3)(4 - p) = 2p + 7 + 12 - 3p$

$= -p + 19$

7. Let the price of a wallet be $\$x$.

\therefore Price of a belt = $\$(x - 30)$

$3x + 2(x - 30) = 290$

$3x + 2x - 60 = 290$

$5x = 290 + 60$

$5x = 350$

$x = 70$

The price of a wallet is \$70.

8. (a) $3(x - 4) - (7 - x) = 3x - 12 - 7 + x$

$= 4x - 19$

(b) $3x + 9y + 2z - (7x - 2y + z)$

$= 3x + 9y + 2z - 7x + 2y - z$

$= -4x + 11y + z$

9. (a) $-4, -1, 2, 5, 8, 11$
 $\begin{array}{cccccc} \curvearrowright & \curvearrowright & \curvearrowright & \curvearrowright & \curvearrowright & \\ +3 & +3 & +3 & +3 & +3 & \end{array}$

(b) $1, 4, 9, 16, 25, 36$

$(1^2) (2^2) (3^2) (4^2) (5^2) (6^2)$

square numbers

10. (a) $x = 6 + 4x$

$x - 4x = 6$

$-3x = 6$

$x = -2$

(b) $7(p - 6) = 3p$

$7p - 42 = 3p$

$7p - 3p = 42$

$4p = 42$

$p = 10.5$

11. (a) $\$(3p + 2q)$

(b) Amount Sam had at first

$= 3p + 2q + (5p - q)$

$= \$(8p + q)$

12. (a) $T_{10} = -2(10) + 3$

$= -20 + 3$

$= -17$

(b) $-2n + 3 = -27$

$-2n = -30$

$n = 15$

The term is T_{15} .

13. (a) $\frac{\sqrt{95} - 3^2}{65 - 2.3} \approx 0.0119105\dots$

$= 0.0119$ (3 s.f.)

(b) $\sqrt{65} - (3.99 + 0.95) \approx \sqrt{64} - (4 + 1)$

$= 8 - 5$

$= 3$

14. $2\frac{1}{2} \text{ h} - 1 \text{ h} = 1\frac{1}{2} \text{ h}$

$= 90 \text{ min}$

Total charges = $\$1.50 + (90 \times 2\text{¢})$

$= \$1.50 + 180\text{¢}$

$= \$1.50 + \1.80

$= \$3.30$

15. Let Tom's current age be x years.

\therefore Tom's father's current age is $(x + 21)$ years.

In three years' time,

$(x + 21) + 3 = 3(x + 3)$ both ages will increase by 3

$x + 24 = 3x + 9$

$24 - 9 = 3x - x$

$15 = 2x$

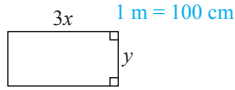
$x = 7.5$

Tom is $7\frac{1}{2}$ years old now.

16. Substituting $v = 26$, $u = -7$ and $t = 3$ into $a = \frac{v-u}{t}$,

$$\begin{aligned} a &= \frac{26 - (-7)}{3} \\ &= \frac{33}{3} \\ &= 11 \end{aligned}$$

17. (a) Breadth = $(100 \times y)$ cm
= $100y$ cm



(b) Area = $(3x)(100y)$ cm²
ensure same units for both length and breadth
= $(300xy)$ cm²

(c) Perimeter = $2(3x + 100y)$ cm
ensure same units for both length and breadth
= $(6x + 200y)$ cm