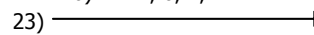


ANSWERS – DIAGNOSTIC TEST for Intermediate Students – Number & Algebra

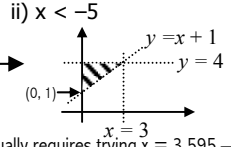
TEST 1 of 2

- 1) i) 4 ii) 120
- 2) i) 23 ii) $2 \times 2 \times 3 \times 5$
- 3) i) 6 ii) -5 iii) 1.5
- 4) i) $y = 4(-3) - 21 = -33$
ii) $y = -(-3)^2 = -9$
- 5) i) $5^{8+3} = 5^{11}$ ii) $a^{6 \times 5 - 6} = a^{24}$
- 6) i) 13.1 ii) 13.15
- 7) i) 1.2×10^3 (also correct but with unnecessary noughts is 1.200×10^3)
ii) 9.998999×10^{10}
- 8) i) 2:3 ii) £8.80 : £13.20
- 9) i) $\frac{11}{12}$ ii) $\frac{20}{21}$
- 12) i) 26 ii) £347.29 (to the nearest penny)
- 13) £15,000
- 14) 12
- 16) i) $3x + 6$ ii) $x^2 + 5x + 6$
- 17) i) $3(2a + 3)$
ii) $(x + 1)(x - 2)$
- 19) $2(x + 5) = 3x$
- 20) i) $x = 5.5$ ii) $x = 5$ iii) $x = 0.25$
- 21) i) $y = \frac{x-1}{2}$ ii) $y = \sqrt[3]{\frac{x}{2}}$ iii) $y = \frac{2x}{x-1}$

TEST 2 of 2

- 22) a) i) $x \leq 7.5$
b) -1, 0, 1, 2.
- 23) 
- 24) a) 51, 66
b) 625, 3125
- 25) $x = 3.59$ (full exam marks usually requires trying $x = 3.595$ – did you?)
- 26) $x = 6$ or $x = -7$
- 28) $x = 4, y = -2$
- 30) $3n + 1$
- 31) a) gradient = 4 y-intercept = -5
b) $y = 3x + 5$
- 32) i) A and B are parallel
- 33) i) a) B→C b) C→D c) speed (or velocity)
ii) a) constant acceleration (between A and B)
b) total distance travelled (between A & D)
c) constant speed.
- 34)

x	-2	-1	0	1	2
x^3	-8	-1	0	1	8
$-x^2$	-4	-1	0	-1	-4
$y = x^3 - x^2$	-12	-2	0	0	4
- 35) i) $-\frac{1}{3}$ ii) A

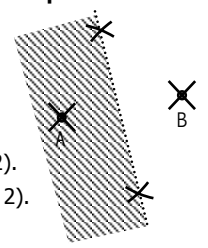


ANSWERS – DIAGNOSTIC TEST for Intermediate Students – Shape and Space

TEST 1 of 1

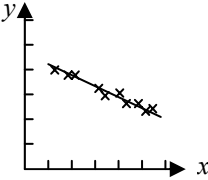
- 1) $x = 18\text{cm}$
- 2) $\theta = 38.682\dots^\circ = 38.7^\circ$ (3 s.f.)
 $a = 15.760\dots\text{cm} = 15.8\text{cm}$ (3 s.f.)
- 6) 075°
- 7) Surface area of cuboid = 52cm^2
Surface area of cylinder = $2 \times \pi \times 2^2 + 2 \times \pi \times 2 \times 8$
 $= 40\pi \text{ cm}^2$ or $125.66\dots\text{cm}^2$
 $= 126\text{cm}^2$ (3sf)
(= 125.6 using $\pi = 3.14$)
- 8) a) Volume of cuboid = 24cm^3
Volume of cylinder = $2^2 \times \pi \times 8 = 32\pi \text{ cm}^3$
or $100.53\dots = 101 \text{ cm}^3$ (3sf)
(100.48 cm^3 using $\pi = 3.14$)
- 9) a) They are perpendicular or meet at right-angles
b) i) 75° ii) 105°

- 12) See construction in SS12
- 13) See perpendicular bisection in SS13.
Diagram shows shading.
- 14) i) Reflection in the line $x = 0.5$
ii) Rotation 90° clockwise about $(1, -3)$
- 15) i) Scale factor 2, centre of enlargement $(0, 2)$.
ii) Scale factor $\frac{1}{2}$, centre of enlargement $(0, 2)$.
- 16) Length $AE = \frac{5}{3} \times 4 = 6\frac{2}{3} = 6.67$ (3 s.f.)
- 18) i) Length ii) Area
- 19) a) $a = \text{distance}$; $b = \text{time}$; $c = \text{mass}$; $d = \text{volume}$
b) Density = $32 \div 6 = 5\frac{1}{3}$ or 5.33 kg/cm^3 (3 s.f.)
- 20) $500,000 \text{ cm}^3 = 500000 \div (100)^3 = 0.5\text{m}^3$



ANSWERS – DIAGNOSTIC TEST for Intermediate Students – Handling Data

TEST 1 of 1

- 1) a) (Strong or Good) Negative Correlation

- b) No correlation and so no line of best fit.
- 2) i) $\frac{5}{50} = \frac{1}{10}$ ii) $0.4 \times 0.3 + 0.6 \times 0.7 = 0.54$
- 3) i) a) By asking leading questions, (or choosing a non-representative or too small a sample e.g. only people who fall within a certain age range).
b) increasing the sample size
ii) Primary is B) b) Secondary (from the newspaper)
- 4) i) Mean = 51.2 (midpoints 10, 30, 50, 70 multiplied by frequencies; summed; \div by sum of frequencies, 100).
ii) Median = 0; mode = 0.
iii) Lower quartile = 0; upper quartile = 3
- 5) i) 44.6; 54.8; 67.
ii) At game number 3

- 6) Plot the **upper class boundaries** against **Cumulative Frequencies (CF)**

Include the starting point $(0, 0)$.
Join points with straight lines or smooth curve.

