



Answers.

KUMON INSTITUTE OF EDUCATION

Mathematics Supervisor Recruitment Test Assessment Guidelines

Maximum time allowed:	30 minutes
Number of questions:	50 [There are 5 questions from each level 2A-I]
Marking sheet:	Enclosed with worked solutions
Mark questions:	Either correct or incorrect
Internal pass mark:	32/50 (subject to the guidelines below)

Base your judgement on the following:

1. Questions marked with a ● are designed to test fundamental skills. Expect a result of at least $\frac{20}{21}$, which allows for one careless error. Please note, E1 must be correct, as this demonstrates basic logic. Think very carefully about selecting candidates who make an error here.
2. It is advisable to observe the candidates while they complete the test. Counting on fingers or scratching out lines on pieces of paper etc, indicate poor basic skills and suggest future problems with worksheet completion.
3. Encourage candidates to show their working and refer to this when making decisions. Poor calculation skills, carelessness or lack of practice may lead to incorrect answers, even though the candidate can use mathematical processes correctly. This will be evident in questions involving multiple processes such as long multiplication/division and the more complex fractions.
4. Candidates who score highly on questions from levels GHI, but who make basic calculation errors in the earlier sections should be viewed more favourably than those who may have scored the same result from only completing the easier calculation questions. Worksheet completion will polish their calculations skills.
5. Judge favourably candidates who attempt more questions, especially those from the higher levels, than those who may have gained the same score from attempting fewer questions. Candidates, who fall into this category, have attempted to recall past knowledge and will find worksheet completion easier.

12A

- 1) $7+4 = 11$
- 2) $3+9 = 12$
- 3) $8+6 = 14$
- 4) $9-7 = 2$
- 5) $10-4 = 6$

Level A

- 6) $13+5 = 18$
- 7) $6+17 = 23$
- 8) $28+9 = 37$
- 9) $14-9 = 5$
- 10) $16-11 = 5$

Level B

- 1)
$$\begin{array}{r} 39 \\ + 45 \\ \hline 84 \end{array}$$
- 2) $225+375 = 600$
- 3)
$$\begin{array}{r} 63 \\ + \boxed{57} \\ \hline 120 \end{array}$$
- 4)
$$\begin{array}{r} 403 \\ - 136 \\ \hline 267 \end{array}$$
- 5) $235-118 = 117$

Level C

- 1) $8 \times 9 = 72$
- 2)
$$\begin{array}{r} 54 \\ \times 8 \\ \hline 432 \end{array}$$

• 3) $72 \div 7 = \boxed{10} \text{ r } \boxed{2}$

• 4) $56 \div 8 = 7$

• 5)
$$\begin{array}{r} 43 \frac{2}{6} = 43 \frac{1}{3} \\ 6 \overline{)260} \\ \underline{258} \\ 2 \end{array}$$

 or $43 \text{ r } 2 \text{ is fine}$

Level D

1)
$$\begin{array}{r} 406 \\ \times 38 \\ \hline 3248 \\ 12180 \\ \hline 15428 \end{array}$$

2)
$$\begin{array}{r} 69 \\ 21 \overline{)1449} \\ \underline{126} \\ 189 \\ \underline{189} \\ 0 \end{array}$$

3) Write $\frac{46}{11}$ as a mixed number

$4 \frac{2}{11}$

4) Reduce $\frac{18}{24} = \frac{3}{4}$

5) Reduce $\frac{34}{51} = \frac{2}{3}$

Level E

• 1) $\frac{3}{5} + \frac{1}{5} = \frac{4}{5}$

2)
$$\frac{1}{6} + \frac{3}{4} = \frac{2+9}{12} = \frac{11}{12}$$

3) $2\frac{2}{3} - 1\frac{1}{2} = 1\frac{4}{6} - \frac{3}{6} = 1\frac{1}{6}$

OR $\frac{8}{3} - \frac{3}{2} = \frac{16-9}{6} = \frac{7}{6} = 1\frac{1}{6}$

4) $1\frac{1}{5} \times \frac{5}{9} = \frac{6}{5} \times \frac{5}{9} = \frac{2}{3}$

5) $1\frac{1}{4} \div 3\frac{1}{8} = \frac{5}{4} \div \frac{25}{8} = \frac{5}{4} \times \frac{8}{25} = \frac{2}{5}$

Level F

$$1) \frac{1}{6} + \frac{1}{2} + \frac{1}{9} = \frac{3+9+2}{18}$$

$$= \frac{14}{18}$$

$$= \frac{7}{9}$$

$$2) 10 - 3 \times 3 = 10 - 9$$

$$= 1$$

$$3) 3 - \frac{1}{2} \div \frac{1}{5} = 3 - \left(\frac{1}{2} \times \frac{5}{1} \right)$$

$$= 3 - \frac{5}{2}$$

$$= 3 - 2\frac{1}{2}$$

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

$$4) 18 \times \frac{1}{3} = 6$$

$$5) \begin{array}{r} 0.6 \\ \times 0.5 \\ \hline 0.30 \end{array} \quad \text{or } 0.3$$

Level G

$$1) -9 - (-6) = -9 + 6$$

$$= -3$$

$$2) \left(-\frac{1}{6} + \frac{1}{4} \right) \div -2 =$$

$$= \left(-\frac{2+3}{12} \right) \div -2$$

$$= \frac{1}{12} \times \frac{1}{2}$$

$$= -\frac{1}{24}$$

$$3) 5x + y + 3 + x - 2y + 5$$

$$= 6x - y + 8$$

$$4) \text{ Solve for } x,$$

$$3x + 5 = 12$$

$$3x = 7$$

$$x = \frac{7}{3}$$

$$x = 2\frac{1}{3}$$

$$5) \text{ Solve for } x,$$

$$3x \left(\frac{x}{3} - 1 \right) = (2-x) \times 3$$

$$x - 3 = 6 - 3x$$

$$4x = 9$$

$$x = \frac{9}{4} = 2\frac{1}{4}$$

OR

$$\frac{x}{3} - 1 = 2 - x$$

$$\frac{x}{3} = 3 - x$$

$$x = 9 - 3x$$

$$4x = 9$$

$$x = \frac{9}{4} = 2\frac{1}{4}$$

Level H

Solve for x ,

$$1) \frac{1-x}{3} = a$$

$$1-x = 3a$$

$$-x = 3a - 1$$

$$\underline{x = 1 - 3a \text{ or } -3a + 1}$$

Solve to find x and y

$$2) 3x + 2y = 7 \quad (1)$$

$$x - 2y = 5 \quad (2)$$

$$(1) + (2)$$

$$4x = 12$$

$$x = 3$$

Sub $x = 3$ into (1)

$$9 + 2y = 7$$

$$2y = -2$$

$$y = -1$$

$$\underline{\text{Soln: } x = 3, y = -1}$$

Solve to find x and y

$$3) 2x + 3y = 22 \quad (1)$$

$$y = x + 4 \quad (2)$$

Sub (2) into (1)

$$2x + 3(x + 4) = 22$$

$$5x + 12 = 22$$

$$5x = 10$$

$$\underline{x = 2}$$

Sub $x = 2$ into (2)

$$y = 2 + 4$$

$$y = 6$$

$$\underline{\text{Soln: } x = 2, y = 6}$$

Solve the inequality

$$4) 3x - 4 < 5x - 2$$

$$-2x < 2 \quad \text{or} \quad -4 < 2x - 2$$

$$\underline{x > -1}$$

$$-2 < 2x$$

$$\underline{x > -1}$$

5) Expand the brackets
and simplify

$$3x(x+4) + 3x(2x-5)$$

$$= 3x^2 + 12x + 6x^2 - 15x$$

$$\underline{= 9x^2 - 3x}$$

Level I

1) Expand and simplify

$$1) (x-5)(2x+3)$$

$$= 2x^2 + 3x - 10x - 15$$

$$\underline{= 2x^2 - 7x - 15}$$

2) Factorise $3x - 18xy$

$$= 3x(1 - 6y)$$

3) Factorise the quadratic

$$x^2 - 7x + 12$$

$$\underline{= (x - 4)(x - 3)}$$

4) Simplify $\sqrt{20}\sqrt{18}$

$$= \sqrt{4 \times 5} \cdot \sqrt{9 \times 2}$$

$$= 2\sqrt{5} \cdot 3\sqrt{2} = \underline{6\sqrt{10}}$$

Solve the equation

$$5) (x-2)^2 = 25$$

$$x - 2 = \pm 5$$

$$x = \pm 5 + 2$$

$$\underline{x = 7 \text{ or } x = -3}$$