



**MODUL
BACK 2 BASIC
2012**



**TERBITAN
JABATAN PELAJARAN JOHOR
&
PANEL PERUNDING MATA PELAJARAN
MATEMATIK TAMBAHAN
NEGERI JOHOR**

PEMBINA MODUL
EN. SUHIZULHISAM BIN KELIWON – SMK PEKAN NANAS, PONTIAN

PRE TEST – BACK TO BASICS
ADDITIONAL MATHEMATICS

NAME :

TIME: 1 HOUR

FORM :

1. $\frac{x}{4} + \frac{3}{x}$	2. $3a - \frac{a}{2}$
3. $8y = \frac{1}{4}$	4. $3m = 10 + \frac{m}{2}$
Expand the following expression (no 5 – 8) 5. $x (2x - 6)$	6. $(2x - 3)(x + 4)$
7. $\frac{1}{3}(6x - 9)$	8. $(2p + 5)^2$

<p>9. Solve the equation</p> $\frac{x+1}{4} = 3$	<p>10. Solve the equation</p> $\frac{16+n}{n} = 5$
<p>11. Factorise completely</p> $2m - 8n$	<p>12. Factorise completely</p> $6p^2 - pq$
<p>13. Factorise completely</p> $2x^2 - 50$	<p>14. Factorise completely</p> $4x^2 + 20x + 25$
<p>15. Simplify</p> $-5rs \times 4r$	<p>16. Simplify</p> $3p^2 \div 12pq$
<p>17. Solve $x + 1 > 2(x - 3)$</p>	<p>18. Solve $\frac{n}{3} < 4$</p>
<p>19. Solve $4 - 2y > y + 8$</p>	<p>20. Solve $6 + x \geq 24$</p>

Solve the following equation (question 21 to 24)

21. $3k - 10 = 17$

22. $12 = \frac{6x}{7}$

23. $\frac{x+3}{4} = \frac{3}{2}$

24. $\frac{k}{4} + 2 = 3$

25. Express x as a subject
 $y = 2x + 8$

26. Express k as a subject
 $2k - \frac{m}{2} = 5$

ALGEBRAIC FORMULAE

 1. Express x as a subject of the formula:

Example : $y = x - 2$ $x - 2 = y$ $x - 2 + 2 = y + 2$ $x = y + 2$	a) $y = x + 5$
b) $x + y - 2 = 0$	c) $2x - y - 3 = 0$
d) $2y - x = 1$	e) $\frac{1}{2}(x + y) = 2$

 2. Express m as a subject of a formula:

Example : $\frac{m}{n} = p$ $n\left(\frac{n}{n}\right) = np$ $m = np$	a) $k = 2m$
b) $\frac{k}{m} = p$	c) $mc^2 = E$
d) $s = \frac{t}{2m}$	e) $pq = \frac{2m}{3}$

3. Express x as a subject of the formula:

Example: $y = \sqrt{x}$ $\sqrt{x} = y$ $(\sqrt{x})^2 = y^2$ $x = y^2$	a) $2r = x^2$
b) $v = \sqrt[3]{x}$	c) $m + n = x^3$
d) $3p + q = \sqrt{x}$	e) $k = x^4$

4. Express t as a subject of the formula:

Example: $\frac{3t-1}{2} = y$ $3t-1 = 2y$ $3t = 2y+1$ $t = \frac{2y+1}{3}$	a) $L = \frac{1}{2}(a+b)t$
b) $\frac{m}{t} - 3 = p$	c) $7r = 5t - 5$
d) $v = u + at^3$	e) $2t - \frac{r}{2} = 3$

5.

<p>Example: Given $\frac{x+a}{x-a} = 2$, express x in terms of a.</p> $x + a = 2(x - a)$ $x + a = 2x - 2a$ $a + 2a = 2x - x$ $3a = x$ $x = 3a$	<p>a) Given that $y = \frac{1+x}{1-x}$, express x in terms of y.</p>
<p>b) Given that $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$, express u in terms of v and f.</p>	<p>c) Given that $\frac{2p+q}{2p-q} = \frac{3}{4}$, express p in terms of q.</p>
<p>d) Given that $p + 3m = 2mn$, express m in terms of n and p.</p>	<p>e) Given that $A = B\left(\frac{C-1}{C}\right)$, express C in terms of A and B.</p>

FRACTIONS
ADDITION OF FRACTIONS

1. Simplify each of the following.

$\frac{1}{5} + \frac{2}{5}$ $= \frac{1+2}{5}$ $= \frac{3}{5}$	a) $\frac{1}{12} + \frac{7}{12}$
b) $\frac{1}{2} + \frac{3}{4}$	c) $\frac{2}{5} + \frac{2}{3}$
d) $\frac{1}{2} + \frac{5}{6}$	e) $\frac{7}{8} + \frac{1}{2}$
f) $\frac{2}{3} + \frac{1}{5}$	g) $3 + \frac{1}{2}$
h) $3\frac{1}{2} + 2\frac{1}{2}$	i) $7\frac{3}{10} + \frac{3}{4}$
j) $2\frac{1}{3} + 3\frac{2}{5}$	k) $5\frac{1}{3} + 2\frac{1}{6}$

**FRACTIONS
SUBTRACTION OF FRACTIONS**

2. Simplify each of the following.

$\frac{3}{4} - \frac{7}{20}$ $= \frac{15-7}{20}$ $= \frac{8}{20} = \frac{2}{5}$	a) $\frac{5}{3} - \frac{2}{3}$
b) $\frac{11}{12} - \frac{3}{4}$	c) $3 - \frac{1}{3}$
d) $3\frac{1}{3} - 2\frac{2}{3}$	e) $12 - \frac{7}{8}$
f) $5\frac{2}{9} - \frac{2}{15}$	g) $1\frac{3}{8} - \frac{1}{4}$
h) $\frac{5}{7} - \frac{1}{3}$	i) $5\frac{3}{8} - 2\frac{1}{6}$
j) $2\frac{1}{3} - \frac{1}{2}$	k) $5\frac{7}{8} - \frac{3}{4}$

FRACTIONS
MULTIPLICATION OF FRACTIONS

3. Simplify each of the following.

$\frac{2}{5} \times \frac{3}{4}$ $= \frac{2 \times 3}{5 \times 4}$ $= \frac{6}{20} = \frac{3}{10}$	a) $\frac{3}{7} \times \frac{2}{3}$
b) $\frac{4}{7} \times 2$	c) $\frac{5}{6} \times 2$
d) $\frac{3}{5} \times 2\frac{1}{2}$	e) $20 \times \frac{3}{5}$
f) $\frac{2}{5} \times \frac{3}{7}$	g) $\frac{1}{8} \times \frac{2}{3}$
h) $2\frac{2}{5} \times 3\frac{1}{2}$	i) $\frac{3}{8} \times \frac{9}{24}$
j) $2\frac{3}{8} \times 3\frac{2}{5}$	k) $\frac{3}{8} \times 3\frac{1}{2}$

FRACTIONS
DIVISION OF FRACTIONS

4. Simplify each of the following.

$\frac{2}{5} \div \frac{3}{4}$ $= \frac{2}{5} \times \frac{4}{3}$ $= \frac{2 \times 4}{5 \times 3} = \frac{8}{15}$	a) $\frac{3}{7} \div \frac{2}{3}$
b) $\frac{4}{7} \div 2$	c) $\frac{6}{7} \div 2$
d) $\frac{4}{5} \div 2\frac{1}{2}$	e) $20 \div \frac{3}{5}$
f) $\frac{2}{5} \div \frac{10}{7}$	g) $\frac{1}{8} \div \frac{2}{3}$
h) $2\frac{2}{5} \div 3\frac{1}{2}$	i) $\frac{3}{8} \div \frac{9}{24}$
j) $2\frac{3}{8} \div 3\frac{2}{5}$	k) $\frac{3}{8} \div 3\frac{1}{2}$

**FRACTIONS
LINEAR EQUATIONS**

5. Solve the following linear equations.

$\frac{5x}{6} - 4 = 11$ $5x - 24 = 66$ $5x = 90$ $x = 18$	a) $\frac{3x}{4} + 7 = 22$
b) $3 + \frac{2x}{5} = 19$	c) $\frac{4x}{7} - 13 = 15$
d) $\frac{3x}{4} = \frac{2x+1}{3}$	e) $\frac{x-5}{3} = \frac{x}{6}$
f) $\frac{x}{9} - \frac{x+2}{3} = 4$	g) $\frac{3x-4}{3} = \frac{3x-4}{4}$
h) $\frac{2x-3}{2} = 3x+5$	i) $2x-4 = \frac{x-3}{2} + 3$

FRACTIONS

ALGEBRAIC EXPRESSIONS

6. Simplify each of the following.

$\frac{a}{3} \times \frac{2b}{5}$ $= \frac{a \times 2b}{3 \times 5}$ $= \frac{2ab}{15}$	a) $\frac{-2g}{f} \times \frac{8f}{h}$
b) $\frac{b}{c} \div \frac{d}{c}$	c) $\frac{2f}{3} \times \frac{3h}{5g}$
d) $\frac{4a}{3b} \div \frac{5ab}{2}$	e) $\frac{3gh}{8e} \times \frac{4e}{15gh^2}$
f) $\frac{9gh^2}{4f^2} \div \frac{12gh^2}{f}$	g) $\frac{4m}{3n} \times \frac{3n}{2m^2 + 4mn}$
h) $\frac{2f}{3} \div \frac{3h}{5g}$	i) $\frac{m^2 - 2m}{4n} \times \frac{3n}{m^2 - 4}$
j) $\frac{3}{b} \div \frac{6c}{b}$	k) $\frac{9g^2}{4f^2} \times \frac{f}{12gh^2}$

**FRACTIONS
LINEAR INEQUALITIES**

7. Solve each of the following inequalities.

$\frac{3x}{4} + 2 \geq 5$ $3x + 8 \geq 20$ $3x \geq 12$ $x \geq 4$	a) $x + \frac{17}{2} \geq -14$
b) $x + \frac{21}{4} \leq \frac{6}{5}$	c) $\frac{x}{5} > 3$
d) $\frac{-x}{3} < 12$	e) $\frac{8x}{3} + 2 > 12$
f) $\frac{-2}{3} \leq \frac{4x}{9}$	g) $\frac{x}{7} + 1 \geq 3$
h) $\frac{5(2x-3)}{4} \geq 5$	i) $\frac{8-x}{6} > \frac{3}{2}$
j) $-2x + 3 \geq 11$	k) $\frac{2x+8}{3} \leq 5 - x$

EXPANSION

1. Expand each of the following :

$3(p+1)$ $= 3p+3$	a) $2(p-3)$
b) $3(k+7)$	c) $2a(b+3)$
d) $2(2k+2)$	e) $2x(x-4)$
f) $-2(2-p)$	g) $-3(2+5a)$
h) $2y(y+3)$	i) $-3x(2-5x)$
j) $\frac{2}{3}(3a+5)$	k) $-3b(-2-2b)$
l) $2(3a+2) - 3(2-5a)$	m) $2(2x-5) + (2x-3)$
l) $(x+3)(x+2)$	m) $(2x+3)(x+5)$

n) $(2x + 5)(x - 3)$	o) $(x - 5)(x + 2)$
p) $(3x - 4)(2x + 1)$	q) $(2x - 3)(3x - 1)$
r) $(2x - y)(x + y)$	s) $(3a + 2b)(2a - 3b)$
t) $(4 - 3y)(y + 2)$	u) $(x + 3)(4 + 3x)$
v) $(4 - 3y)^2$	w) $(x + 3)^2$
x) $(x + y)^2$	y) $(2x - 3y)^2$

FACTORISATION

1. Factorise each of the following algebraic expressions completely

$\begin{aligned} 3x + 6y \\ = 3(x + 2y) \end{aligned}$	a) $2m - 6n$
b) $ab + ac$	c) $7p - 21q$
d) $mn - 2m$	e) $2a + 6$
f) $2x - 8xy$	g) $3mn - 12m$
h) $4ab + 6b$	i) $6pq - 20q$
j) $x^2y + xy^2$	k) $4y^2 - 14y$
l) $2p^2 + 4pq$	m) $6mn - 10m^2n^2$
n) $3a^2 + 2ab$	o) $xy - 3xy^2$

2. Factorise each of the following algebraic expressions completely

$\begin{aligned}x^2 - 25 \\ &= x^2 - 5^2 \\ &= (x - 5)(x + 5)\end{aligned}$	a) $y^2 - 4$
b) $a^2 - 81$	c) $x^2 - 36$
d) $m^2 - 64$	e) $x^2 - y^2$
f) $3y^2 - 48$	g) $9m^2 - 4$
h) $2m^2 - 72$	i) $25a^2 - 36b^2$
j) $16a^2 - b^2$	k) $3x^2 - 3y^2$

3. Factorise each of the following algebraic expressions completely

$\begin{aligned}x^2 + 2xy + y^2 \\&= x^2 + 2(xy) + y^2 \\&= (x + y)(x + y) \\&= (x + y)^2\end{aligned}$	a) $x^2 - 2xy + y^2$
b) $x^2 + 6x + 9$	c) $x^2 + 12x + 36$
d) $y^2 + 8y + 16$	e) $k^2 - 14k + 49$
f) $x^2 - 4x + 4$	g) $4x^2 + 20x + 25$
h) $9y^2 - 24y + 16$	i) $9y^2 - 12y + 4$
j) $9y^2 - 6y + 1$	k) $4x^2 + 4x + 1$

4. Factorise each of the following algebraic expressions completely

$\begin{aligned} x^2 + 2x - 3 \\ = (x - 1)(x + 3) \end{aligned}$	a) $y^2 - 7y + 10$
b) $x^2 + 8x + 12$	c) $x^2 - 4x - 5$
d) $2x^2 + 7x + 6$	e) $3y^2 - y - 2$
f) $a^2 - 2a - 8$	g) $y^2 - 7y + 12$
h) $2y^2 - 9y + 7$	i) $3x^2 + 14x + 8$
j) $2y^2 - y - 6$	k) $x^2 - 9x + 8$

SIMPLIFICATION

Simplify the following algebraic expressions

$\begin{aligned}7x - (3x - 2x) \\= 7x - 3x + 2x \\= x\end{aligned}$	a) $8k - (4k - 2k)$
b) $6q - (8q - 4q)$	c) $4p - (2p - 5p)$
d) $5j - (2h - 3j)$	e) $17p - (8p - 6q)$
f) $-4mn - (5mr - 3mn)$	g) $6pq - (xy - 4pq)$
h) $3pq - 2(4xy - 2pq)$	i) $6 - 5xy - 2(mn - 8xy)$
j) $3(x + 5pr) - 2(y - 4pr)$	k) $4xy + 6xz - 4(3xy - 2xz)$

l) $(x + y)^2 - 5xy$	m) $(3x + 2)^2 - 4x^2$
n) $6xy - (3x + 2y)^2$	o) $(x + 2y)^2 - 5xy$
p) $(3x - 1)^2 - (7x + 4)$	q) $(2p - q)^2 + q(4p - q)$
r) $(3p - q)^2 - 4(p^2 - 2pq)$	s) $2n(m + 3mn) - (m - 2n)^2$
t) $3(2p - 5) + (p - 3)^2$	u) $3(6mn - 7n^2) + (2m - n)^2$
v) $\frac{1}{2}(p + 2q - m) + \frac{1}{3}(p + 6q - m)$	w) $\frac{1}{3}(m - 12q - p) + \frac{2}{3}(m - 6q + 2p)$

LINEAR EQUATION

Solve the following linear equations

Example : $2x + 3 = 9$ $2x = 9 - 3$ $2x = 6$ $x = 3$	a) $y - 5 = 12$
b) $w + 4 = 8$	c) $m - 6 = -12$
d) $2x + 5 = -11$	e) $3y - 9 = 18$
f) $4p + 16 = 20$	g) $7q - 20 = 1$
h) $2m - 3 = 3m + 7$	i) $3y + 5 = 2y - 3$
j) $3x + 12 = 5x - 8$	k) $p + 5 = 4p + 17$

<p>Example :</p> $\frac{n}{2} = 3$ $\left[\frac{n}{2} = 3\right] \times 2$ $n = 6$	a) $\frac{x}{2} = 3$
b) $\frac{x}{4} = 5$	c) $\frac{a}{6} = -5$
d) $\frac{2y}{3} = 6$	e) $\frac{3x}{5} = -2$
f) $2 = \frac{4n}{3}$	g) $10 = \frac{5p}{4}$

<p>Example :</p> $\frac{n}{2} + 4 = 1$ $\frac{n}{2} = 1 - 4$ $\frac{n}{2} = -3$ $n = (-3)(2)$ $n = 6$	a) $\frac{x}{2} - 9 = 3$
b) $\frac{x}{4} + 3 = 5$	c) $\frac{a}{6} - 12 = -5$
d) $4 + \frac{y}{3} = 6$	e) $3 - \frac{x}{5} = -2$
f) $2 = \frac{n}{3} - 8$	g) $10 = 7 - \frac{p}{4}$

<p>Example :</p> $\frac{5n}{2} + 4 = 2n$ $\left[\frac{5n}{2} + 4 = 2n\right] \times 2$ $5n + 8 = 4n$ $5n - 4n = -8$ $n = -8$	a) $\frac{3x}{2} - 12 = 3x$
b) $\frac{x}{4} + 3 = 1$	c) $\frac{a}{6} - 12 = -5a$
d) $4 + \frac{2y}{3} = 6y$	e) $2x - \frac{3x}{5} = -2$
f) $12 = \frac{4n}{3} - 8n$	g) $2p = 7 - \frac{3p}{4}$

POST TEST
ADDITIONAL MATHEMATICS

NAME :

TIME : 1 HOUR

FORM :

1. $\frac{x}{3} - \frac{2}{x}$	2. $5x + \frac{x}{2}$
3. $\frac{1}{4}y = \frac{1}{4}$	4. $4m = 10 - \frac{m}{2}$
5. $(2x - 6)(-3x)$	6. $(x - y)(y - x)$
7. $\frac{1}{3}(9b - 9)$	8. $(2x - 3)^2$

$$9. \frac{1}{x+4} = 3$$

$$10. \frac{2m-4}{m} = 5$$

Factorise the following completely (Questions 11 to 14)

$$11. 5k + 10m$$

$$12. xy + 3x^2y$$

$$13. 3y^2 - 48$$

$$14. 9y^2 - 12y + 4$$

$$15. \text{Simplify} \\ -20abc \times 5bc$$

$$16. \text{Simplify} \\ 32p^2q \div 8pq$$

$$17. \text{Solve } x - 4 > 3(x + 1)$$

$$18. \text{Solve } \frac{5}{m} < 4$$

19. $5y - 2 > y + 14$

20. $\frac{x-6}{2x} < 5$

Solve the following equation (question 21 to 24)

21. $5m - 10 = 5$

22. $7 = \frac{3}{x}$

23. $\frac{y-5}{3} = \frac{6}{5}$

24. $\frac{n}{3} - 5 = 4$

25. Express y as the subject
 $4m + 3y = 2(k + 4)$

26. Express m as the subject
 $4m + \frac{h}{2} = 3$

Answers:		
<u>Pre Test</u>		
1. $\frac{x^2 + 12}{4x}$	19. $y < -\frac{4}{3}$	10. $m = -\frac{4}{3}$
2. $\frac{5a}{2}$	20. $x \geq 18$	11. $5(k+2m)$
3. $\frac{1}{32}$	21. $k = 9$	12. $xy(1 + 3x)$
4. $m = 4$	22. $x = 14$	13. $3(y + 4(y - 4))$
5. $2x^2 - 6x$	23. $x = 3$	14. $(3y-2)(3y-2)$
6. $2x^2 + 5x - 12$	24. $k = 4$	15. $-100ab^2c^2$
7. $2x - 3$	25. $x = \frac{y-8}{2}$	16. $4p$
8. $4p^2 + 20p + 25$	26. $k = \frac{m+10}{k}$	17. $x < -\frac{7}{2}$
9. $x = 11$	<u>Ujian Post.</u>	18. $m > \frac{5}{4}$
10. $n = 4$	1. $\frac{x^2 - 6}{3x}$	19. $y < 4$
11. $2(m-4n)$	2. $\frac{11x}{2}$	20. $x > \frac{2}{3}$
12. $p(6p-q)$	3. $y = 1$	21. $m=3$
13. $2(x+5)(x-5)$	4. $m = \frac{20}{9}$	22. $x = \frac{3}{7}$
14. $(2x+5)(2x+5)$	5. $-6x^2 + 18x$	23. $y = \frac{43}{5}$
15. $-20r^2s$	6. $xy - x^2 - y^2 + xy$	24. $n = 27$
16. $\frac{p}{4q}$	7. $3b - 3$	25. $y = \frac{2k + 8 - 4m}{3}$
17. $x < 7$	8. $4x^2 - 12x + 9$	26. $m = \frac{6-h}{8}$
18. $n < 12$	9. $x = -\frac{11}{3}$	