

# Jawapan

## Praktis 1

### Praktis Formatif

- 1 A Betul/Correct  
 B Betul/Correct  
 C Betul/Correct  
 D Salah/Wrong

Jawapan/Answer: D

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Pendaraban berulang Repeated multiplication	Bentuk indeks Index form
$5 \times 5 \times 5 \times 5$	$5^4$
$7 \times 7 \times 7 \times 7 \times 7 \times 7$	$7^6$
$(-2) \times (-2) \times (-2) \times (-2) \times (-2)$	$(-2)^5$
$k \times k \times k \times k \times k \times k \times k$	$k^7$

- 3 (a)  $7^3$   
 (b)  $5.4^{10}$   
 (c)  $(-a)^9$   
 (d)  $m^x$

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Nombor Number	Bentuk indeks Index form
(a) 256	$2^8$
(b) 243	$3^5$
(c) 625	$5^4$
(d) 1 000 000	$10^6$

- 5 (a)  $1.6^3 = 1.6 \times 1.6 \times 1.6$   
 $= (1.6 \times 1.6) \times 1.6$   
 $= 2.56 \times 1.6$   
 $= 4.096$   
 (b)  $0.3^4 = 0.3 \times 0.3 \times 0.3 \times 0.3$   
 $= (0.3 \times 0.3) \times (0.3 \times 0.3)$   
 $= 0.09 \times 0.09$   
 $= 0.0081$   
 (c)  $\left(\frac{4}{7}\right)^3 = \frac{4}{7} \times \frac{4}{7} \times \frac{4}{7}$   
 $= \left(\frac{4}{7} \times \frac{4}{7}\right) \times \frac{4}{7}$   
 $= \frac{16}{49} \times \frac{4}{7}$   
 $= \frac{64}{343}$

$$\begin{aligned} \text{(d)} \left(1\frac{1}{2}\right)^5 &= \left(\frac{3}{2}\right)^5 \\ &= \frac{3}{2} \times \frac{3}{2} \times \frac{3}{2} \times \frac{3}{2} \times \frac{3}{2} \\ &= \left(\frac{3}{2} \times \frac{3}{2}\right) \times \left(\frac{3}{2} \times \frac{3}{2}\right) \times \frac{3}{2} \\ &= \frac{9}{4} \times \frac{9}{4} \times \frac{3}{2} \\ &= \left(\frac{9}{4} \times \frac{9}{4}\right) \times \frac{3}{2} \\ &= \frac{81}{16} \times \frac{3}{2} \\ &= \frac{243}{32} \\ &= 7\frac{19}{32} \end{aligned}$$

$$\begin{array}{r} \text{6 (a) } 6 \overline{) 216} \\ \underline{6} \phantom{0} \\ 36 \\ \underline{36} \\ 6 \\ \underline{6} \\ 1 \end{array}$$

$$\text{(b) } 216 = 6 \times 6 \times 6 = 6^3$$

$$\text{7 } x = a^8 \text{ dan } y = a^2$$

$$x = a^8 \text{ and } y = a^2$$

$$\text{A } xy = a^8 \times a^2 = a^{8+2} = a^{10}$$

$$\text{B } \frac{x}{y} = \frac{a^8}{a^2} = a^{8-2} = a^6 \neq a^4$$

$$\text{C } \frac{y}{x} = \frac{a^2}{a^8} = a^{2-8} = a^{-6} = \frac{1}{a^6}$$

$$\text{D } x = a^8 = (a^2)^4 = y^4$$

Jawapan/Answer: B

- 8 (a)  $2^5 \times 2^3 = (2 \times 2 \times 2 \times 2 \times 2) \times (2 \times 2 \times 2)$   
 $= 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$   
 $= 2^8$   
 (b)  $2^{5+3} = 2^8$   
 (c)  $2^5 \times 2^3 = 2^{5+3}$

9 (a)  $3^4 \times 3^2 \times 3^3 = 3^{4+2+3}$   
 $= 3^9$  [X]

(b)  $m^3 \times m^6 \times m^5 = m^{3+6+5}$   
 $= m^{14}$  [✓]

(c)  $p^9 \times p^4 \times p^3 = p^{9+4+3}$   
 $= p^{16}$  [X]

(d)  $y^8 \times y^2 \times y^{10} = y^{8+2+10}$   
 $= y^{20}$  [✓]

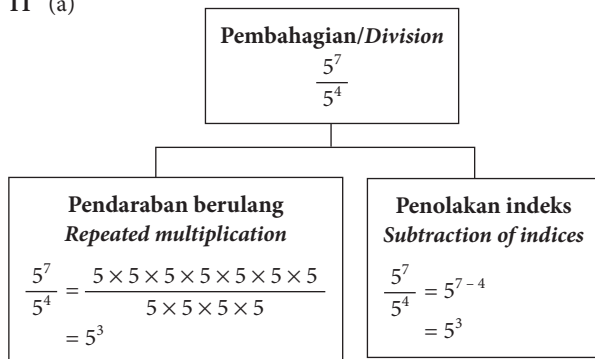
10 (a)  $5^7 \times 5^9 = 5^{16}$

(b)  $k^4 \times k^6 = k^{10}$

(c)  $t^5 \times t^{15} = t^{20}$

(d)  $w^{18} \times w^8 = w^{26}$

11 (a)



(b)  $\frac{5^7}{5^4} = 5^{7-4}$

12 (a)  $3^9 \div 3^5 = 3^4$

(b)  $6^{11} \div 6^3 = 6^8$

(c)  $m^{16} \div m^{10} = m^6$

(d)  $s^7 \div s^2 = s^5$

13 (a)  $2^p \div 2^5 = 2^q$

$$2^{p-5} = 2^q$$

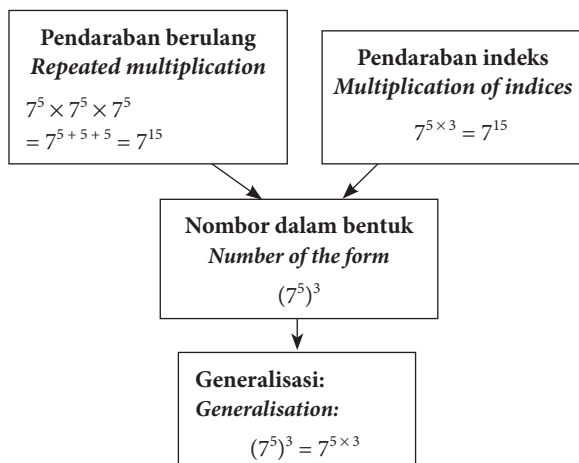
$$p - 5 = q$$

$$p - q = 5$$

(b)

<b>p</b>	8	14	17	21
<b>q</b>	3	9	12	16

14



15 (a)  $(p^3)^2 = p^{3 \times 2}$   
 $= p^{2 \times 3}$   
 $= (p^2)^3$  [✓]

(b)  $(q^4)^6 = q^{4 \times 6}$   
 $= q^{24}$  [✓]

(c)  $(r^5)^4 = r^{5 \times 4}$   
 $= r^{20}$  [X]

(d)  $(9^2)^9 = ((3^2)^2)^9$   
 $= (3^{2 \times 2})^9$   
 $= (3^4)^9$   
 $= 3^{4 \times 9}$   
 $= 3^{36}$  [X]

16 (a)  $(2^9)^3 = 2^{27}$

(b)  $(6^4)^5 = 6^{20}$

(c)  $(x^3)^4 = x^{12}$

(d)  $(y^6)^3 = y^{18}$

17 (a)  $(3a^2)^3 = 3a^2 \times 3a^2 \times 3a^2$   
 $= (3 \times 3 \times 3) \times (a^2 \times a^2 \times a^2)$   
 $= 3^3 \times (a^2)^3$   
 $= 27 \times a^6$   
 $= 27a^6$

(b)  $(h^3k^4n^7)^5 = (h^3)^5(k^4)^5(n^7)^5$   
 $= h^{15}k^{20}n^{35}$

18 (a) (i)  $a^5 \div a^5 = \frac{a^5}{a^5}$   
 $= \frac{a \times a \times a \times a \times a}{a \times a \times a \times a \times a}$   
 $= 1$

(ii)  $a^5 \div a^5 = a^{5-5}$   
 $= a^0$

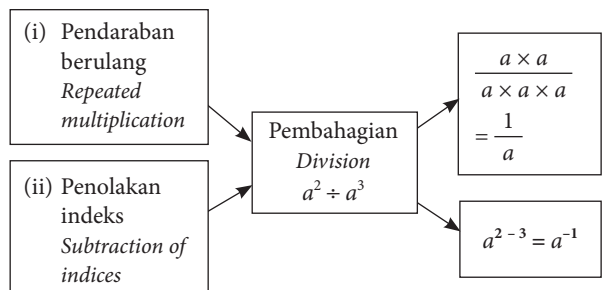
(b) (i)  $a^0 = 1$  bagi nilai  $a$  bukan sifar.  
 $a^0 = 1$  for non-zero value of  $a$ . [✓]

(ii)  $a^0 = 1$  bagi semua nilai  $a$ .  
 $a^0 = 1$  for all values of  $a$ . [X]

(c) (i)  $9.7^{15} \div 9.7^{15} = 1$

(ii)  $\left(3\frac{7}{12}\right)^8 \div \left(3\frac{7}{12}\right)^8 = 1$

19 (a)



(b)  $a^{-1} = \frac{1}{a}$

20 (a) ✓ (b) X (c) ✓ (d) ✓

21 (a)  $2^{-13} = \frac{1}{2^{13}}$  (b)  $\frac{1}{12^{-6}} = 12^6$

$$(c) 5^{-4} = \frac{1}{5^4}$$

$$(d) \left(\frac{3}{2}\right)^{-2} = \left(\frac{2}{3}\right)^2$$

22

Nombor Number	$\frac{1}{3}$	as	$\frac{1}{14^2}$	as	$\frac{1}{10^5}$	as	$\left(\frac{4}{7}\right)^8$
Bentuk Form $a^{-n}$	$3^{-1}$		$14^{-2}$		$10^{-5}$		$\left(\frac{7}{4}\right)^{-8}$

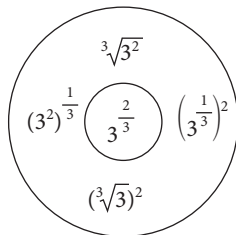
$$23 (a) (2^3)^{\frac{1}{4}}$$

$$(b) \sqrt[5]{10^2}$$

$$(c) \sqrt[3]{6^2}$$

$$(d) (\sqrt[7]{3})^4$$

24



$$25 (a) x = 5, y = 4$$

$$(b) x = 7, y = 3$$

$$26 (a) 2^4 \times 4 = 2^4 \times 2^2 = 2^{4+2} = 2^6$$

$$(b) 8^2 \div 2 = (2^3)^2 \div 2 = 2^6 \div 2^1 = 2^{6-1} = 2^5$$

$$(c) 2^7 \times 2^6 \div 2^3 = 2^{7+6-3} = 2^{10}$$

$$(d) 2^{15} \div (2^5)^2 \times 2^2 = 2^{15} \div 2^{10} \times 2^2 = 2^{15-10+2} = 2^7$$

$$27 (a) 3^4 \times 3^2 \times 3^8 = 3^{4+2+8} = 3^{14} \quad [\checkmark]$$

$$(b) 7^2 \times 7^5 \times 7^3 \times 7 = 7^2 \times 7^5 \times 7^3 \times 7^1 = 7^{2+5+3+1} = 7^{11} \quad [\times]$$

$$(c) (2^3)^3 \times 2^4 = 2^9 \times 2^4 = 2^{9+4} = 2^{13} \quad [\times]$$

$$(d) 5^{10} \times (5^2)^4 = 5^{10} \times 5^8 = 5^{10+8} = 5^{18} \quad [\checkmark]$$

$$28 (a) 2^{-2} \times 3^{-1} = \frac{1}{4} \times \frac{1}{3} = \frac{1}{12}$$

$$(b) 7^{-1} \div 6^{-1} = \frac{1}{7} \div \frac{1}{6} = \frac{1}{7} \times 6 = \frac{6}{7}$$

$$29 (a) 32^{\frac{4}{5}} \times 27^{\frac{2}{3}} = (2^5)^{\frac{4}{5}} \times (3^3)^{\frac{2}{3}} = 2^4 \times 3^2 = 16 \times 9 = 144$$

$$(b) 625^{\frac{1}{4}} \div 5^{-1} = (5^4)^{\frac{1}{4}} \div \frac{1}{5} = 5^1 \times 5 = 25$$

$$(c) 3^{\frac{1}{3}} \times 9^{-\frac{1}{4}} \times 3^{\frac{1}{6}} = 3^{\frac{1}{3}} \times (3^2)^{-\frac{1}{4}} \times 3^{\frac{1}{6}} = 3^{\frac{1}{3}} \times 3^{-\frac{1}{2}} \times 3^{\frac{1}{6}} = 3^{\frac{1}{3}-\frac{1}{2}+\frac{1}{6}} = 3^0 = 1$$

$$(d) 81^{-\frac{3}{4}} \div 49^{-\frac{1}{2}} \times \left(\frac{2}{3}\right)^{-1} = (3^4)^{-\frac{3}{4}} \div (7^2)^{-\frac{1}{2}} \times \left(\frac{2}{3}\right)^{-1} = 3^{-3} \div 7^{-1} \times \frac{3}{2} = \frac{1}{27} \div \frac{1}{7} \times \frac{3}{2} = \frac{1}{27} \times 7 \times \frac{3}{2} = \frac{7}{18}$$

$$30 \ 2^{\frac{3}{2}} \times \left(2^{\frac{1}{8}} \times 3^{-\frac{1}{2}} \times 2^0\right)^4 = 2^{\frac{3}{2}} \times \left(2^{\frac{1}{8}} \times 3^{-\frac{1}{2}} \times 1\right)^4 = 2^{\frac{3}{2}} \times \left(2^{\frac{1}{8}} \times 3^{-\frac{1}{2}}\right)^4 = 2^{\frac{3}{2}} \times \left(2^{\frac{1}{8}}\right)^4 \times \left(3^{-\frac{1}{2}}\right)^4 = 2^{\frac{3}{2}} \times 2^{\frac{1}{2}} \times 3^{-2} = 2^{\frac{3}{2}+\frac{1}{2}} \times \frac{1}{9} = 2^2 \times \frac{1}{9} = 4 \times \frac{1}{9} = \frac{4}{9}$$

Jawapan/Answer: B

### Praktis Sumatif

1

$$\begin{array}{r} 6 \overline{) 1296} \\ \underline{6} \phantom{00} \\ 6 \phantom{00} \\ \underline{6} \phantom{00} \\ 6 \phantom{00} \\ \underline{6} \phantom{00} \\ 0 \phantom{00} \end{array}$$

$$1296 = 6 \times 6 \times 6 \times 6 = 6^4$$

**Kaedah alternatif**  
**Alternative method**

2	1 296
2	648
2	324
2	162
3	81
3	27
3	9
3	3
	1

$$\begin{aligned} 1 \ 296 &= 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 3 \\ &= (2 \times 3) \times (2 \times 3) \times (2 \times 3) \times (2 \times 3) \\ &= 6 \times 6 \times 6 \times 6 \\ &= 6^4 \end{aligned}$$

Jawapan/Answer: C

$$\begin{aligned} 2 \quad 35^{\frac{1}{7}} &= (35^3)^{\frac{1}{7}} \\ &= \sqrt[7]{35^3} \\ \therefore m &= 3, n = 7 \end{aligned}$$

Jawapan/Answer: A

$$\begin{aligned} 3 \quad a^5 \times (a^n)^4 &= a^{17} \\ a^5 \times a^{4n} &= a^{17} \\ a^{5+4n} &= a^{17} \\ 5 + 4n &= 17 \\ 4n &= 12 \\ n &= 3 \end{aligned}$$

Jawapan/Answer: D

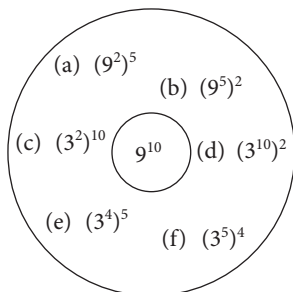
$$\begin{aligned} 4 \quad 8^n \div 4^4 &= 2 \\ (2^3)^n \div (2^2)^4 &= 2 \\ 2^{3n} \div 2^8 &= 2 \\ 2^{3n-8} &= 2^1 \\ 3n - 8 &= 1 \\ 3n &= 9 \\ n &= 3 \end{aligned}$$

Jawapan/Answer: A

- 5 A Salah/Wrong  
B Salah/Wrong  
C Betul/Correct  
D Salah/Wrong

Jawapan/Answer: C

6



$$\begin{aligned} 7 \quad 2^m \times 2^n &= 2^5 \\ 2^{m+n} &= 2^5 \\ m+n &= 5 \\ \therefore m &= 2, n = 3; m = 4, n = 1; m = 3, n = 2 \end{aligned}$$

$$\begin{aligned} 8 \quad \frac{5^x}{5^4} &= 5^y \\ (a) \quad 5^{x-4} &= 5^y \\ x-4 &= y \\ (b) \text{ Apabila/When } y &= 3, x-4 = 3 \\ x &= 7 \end{aligned}$$

$$\begin{aligned} 9 \quad (10^2)^3 &= (\sqrt{10})^k = (10^m)^{\frac{2}{3}} = (\sqrt[5]{10^3})^n \\ (10^2)^3 &= \left(10^{\frac{1}{2}}\right)^k = (10^m)^{\frac{2}{3}} = \left(10^{\frac{3}{5}}\right)^n \\ 10^6 &= 10^{\frac{1}{2}k} = 10^{\frac{2}{3}m} = 10^{\frac{3}{5}n} \\ 6 &= \frac{1}{2}k \\ \therefore k &= 12 \\ 6 &= \frac{2}{3}m \\ \therefore m &= 9 \\ 6 &= \frac{3}{5}n \\ \therefore n &= 10 \end{aligned}$$

$$\begin{aligned} 10 \quad (a) \quad 10p^{-3} &= \frac{10}{p^3} \\ &= \frac{10}{15} \\ &= \frac{2}{3} \end{aligned}$$

$$\begin{aligned} (b) \quad (i) \quad p^6 - 25 &= (p^3)^2 - 25 \\ &= 15^2 - 25 \\ &= 225 - 25 \\ &= 200 \end{aligned}$$

$$\begin{aligned} (ii) \quad p^6 - 25 &= (p^3 + 5)(p^3 - 5) \\ &= (15 + 5)(15 - 5) \\ &= (20)(10) \\ &= 200 \end{aligned}$$

$$\begin{aligned} 11 \quad 3^7 &= 2 \ 187 \\ (a) \quad 3^9 &= 3^7 \times 3^2 \\ &= 2 \ 187 \times 9 \\ &= 19 \ 683 \\ (b) \quad 3^{-6} &= 3^1 \div 3^7 \\ &= 3 \div 2 \ 187 \\ &= \frac{3}{2 \ 187} \\ &= \frac{1}{729} \end{aligned}$$

$$\begin{aligned}
 12 \quad \frac{(3^{-3})^2 \times 7^{-1} \times 9^5}{7 \times (3^{-1})^{-4}} &= \frac{3^{-6} \times 7^{-1} \times (3^2)^5}{7^1 \times 3^4} \\
 &= \frac{3^{-6} \times 7^{-1} \times 3^{10}}{7^1 \times 3^4} \\
 &= 3^{-6+10-4} \times 7^{-1-1} \\
 &= 3^0 \times 7^{-2} \\
 &= 1 \times \frac{1}{49} \\
 &= \frac{1}{49}
 \end{aligned}$$

$$\begin{aligned}
 13 \quad \frac{5^{-1} \times 25^{\frac{3}{4}}}{125^{\frac{2}{3}} \times \sqrt{5}} &= \frac{5^{-1} \times (5^2)^{\frac{3}{4}}}{(5^3)^{\frac{2}{3}} \times 5^{\frac{1}{2}}} \\
 &= \frac{5^{-1} \times 5^{\frac{3}{2}}}{5^2 \times 5^{\frac{1}{2}}} \\
 &= 5^{-1+\frac{3}{2}-2-\frac{1}{2}} \\
 &= 5^{-2} \\
 &= \frac{1}{25}
 \end{aligned}$$

$$\begin{aligned}
 14 \quad 8^{x+5} \times 32^{6-x} &= (2^3)^{x+5} \times (2^5)^{6-x} \\
 &= 2^{3(x+5)} \times 2^{5(6-x)} \\
 &= 2^{3(x+5)+5(6-x)} \\
 &= 2^{3x+15+30-5x} \\
 &= 2^{45-2x}
 \end{aligned}$$

$$\begin{aligned}
 15 \quad (4h^5k^2)^3 \times \frac{1}{2}h^{-9}k^4 &= 4^3(h^5)^3(k^2)^3 \times \frac{1}{2}h^{-9}k^4 \\
 &= 64h^{15}k^6 \times \frac{1}{2}h^{-9}k^4 \\
 &= 32h^{15-9}k^{6+4} \\
 &= 32h^6k^{10}
 \end{aligned}$$