

1A

1) $\frac{1}{9}$

2) $\frac{1}{X}$

3) $\frac{4}{9}$

4) 8

5) X^5

6) $\frac{1}{8}$

7) 2^{11}

8) R^7

9) X^{-2} or $\frac{1}{X^2}$

10) 3^{A+B}

11) $4^0 = 1$

12) X^{3A+B}

13) $\frac{1}{5^4}$ or $\frac{1}{625}$

14) Y^3

15) $2^{-2} = \frac{1}{4}$

16) X^9

17) B^{-6} or $\frac{1}{B^6}$

18) Y^{-4} or $\frac{1}{Y^4}$

19) X^{12}

20) $5^0 = 1$

21) A^{12}

22) $A^3B^3A^2B^{-4} = A^5B^{-1}$ or $\frac{A^5}{B}$

23) $H^{-4}N^6H^{-1}N^{-2} = H^{-5}N^4$ or $\frac{N^4}{H^5}$

24) $P^{-2}Q^0P^3Q^1Q^{-6}P^{-4} = P^{-3}Q^{-5}$ or $\frac{1}{P^3Q^5}$

1B

1) $\frac{1}{4^3} = \frac{1}{64}$

2) 343

3) $\frac{-1}{-27} = \frac{1}{27}$

4) A

5) $3^2 = 9$

6) $\frac{1}{9}$

7) 3^5 or 243

8) X^9

9) Y^{-6} or $\frac{1}{Y^6}$

10) 2^{A+3B}

11) $6^2 = 36$

12) $A^0 = 1$

13) B^{-1} or $\frac{1}{B}$

14) X^8

15) $3^{-1} = \frac{1}{3}$

16) 6^A

17) Y^4

18) A^{-9} or $\frac{1}{A^9}$

19) Y^{-20} or $\frac{1}{Y^{20}}$

20) $8^0 = 1$

21) Z^{-30} or $\frac{1}{Z^{30}}$

22) $X^2Y^{-2}X^4Y^5 = X^6Y^3$

23) $3^3A^3 \cdot 3B = 3^3A \cdot 3B$

24) $R^5S \cdot 3S^2S^{-1}R^{-6}R^{-3} = R^{-4}S^{-2}$ or $\frac{1}{R^4S^2}$

1C

1) $\frac{1}{25}$

2) $4^3 = 64$

3) X^{A-B}

4) 1

5) Y^{DG}

6) $(8A^3)^2 = 64A^6$

7) $\frac{X^4 X^5}{Y^3} = \frac{X^9}{Y^3}$ or $X^9 Y^{-3}$

8) $X^{-3} X^1 X^5 Y^{-4} Y^2 Y^{-2} = X^3 Y^{-4}$

9) $-(14)(14) = -196$

10) $(-15)(-15) = 225$

11) $\left[\frac{1}{7} - \frac{1}{2} D = \frac{3}{8} \right] \times 56 =$

$$\frac{56}{1} \cdot \frac{1}{7} - \frac{56}{1} \cdot \frac{1}{2} D = \frac{56}{1} \cdot \frac{3}{8}$$

$$8 - 28D = 21$$

$$\frac{-8}{-28D} = \frac{13}{28}$$

$$D = -\frac{13}{28}$$

12) $[1.1 - .086 = 2.4B] \times 1000 \Rightarrow 1100 - 86 = 2400B$

$$1014 = 2400B \quad B = \frac{1014}{2400} = \frac{169}{400}$$

13) $\left[3 + 2 \frac{1}{5} = \frac{1}{2} M - \frac{3}{10} \right] \times 10 =$

$$30 + 22 = 5M - 3$$

$$55 = 5M$$

$$11 = M$$

14) $[.388 = 1.3 + .3Q] \times 1000$

$$388 = 1300 + 300Q$$

$$-912 = 300Q \quad Q = \frac{-912}{300} = -3 \frac{1}{25}$$

15) $6A(2A - B)$

16) $3B(5AB^2 + 6A - 7B)$

17) $-13X^2 + 26X - 52$

18) $X^3 Y + X^5$

19) $[15 - 6 + 8^2 \div 2 \div 4] \times [9^2 - 10^2]$

$$[15 - 6 + 64 \div 2 \div 4] \times [81 - 100]$$

$$[15 - 6 + 32 \div 4] \times 19$$

$$[15 - 6 + 8] \times 19 = 17 \times 19 = 323$$

20) $[4 \times 8 - 5 + 2]^2 - [3 - 6 - 7^2 \times 9] =$

$$[32 - 5 + 2]^2 - [3 - 6 - 49 \times 9] =$$

$$[29]^2 - [3 - 6 - 441] =$$

$$841 - 444 = 397$$

1D

1) 1

2) $\frac{1}{2^4} = \frac{1}{16}$

3) 5^{-8} or $\frac{1}{5^8}$

4) $9^{9-3} = 9^6$

5) 8^{35}

6) 1

7) $9M^{-7}N^5$ or $\frac{9N^5}{M^7}$

8) $R^{-1}P^{-13}$ or $\frac{1}{RP^{13}}$

9) $\left(-\frac{6}{5}\right)^2 = \frac{36}{25} = 1 \frac{11}{25}$

10) -8

11) $\left[\frac{3}{4} - \frac{5}{6} R = \frac{7}{10} \right] \times 60 =$

$$45 - 50R = 42$$

$$-50R = -3$$

$$R = 3/50$$

12) $[.5Y + .3 = .002] \times 1000 \Rightarrow 500Y + 300 = 2$

$$500Y = -298$$

$$Y = -298/500$$

$$= -149/250$$

13) $\left[3 \frac{2}{3} - \frac{5}{12} K = 1 \frac{1}{4} \right] \times 12 =$

$$44 - 5K = 15$$

$$-5K = -29$$

$$K = 29/5 = 5 \frac{4}{5}$$

14) $[1.203H + .9 = -.6] \times 1000$

$$1203H + 900 = -600$$

$$1203H = -1500$$

$$H = -1500/1203 = -1 \frac{99}{401}$$

15) $7X(8 - 7A - 4X)$

16) $4X(1 - 4X^2)$

17) $8X^3(X - 5 + 3X^2) = 8X^4 - 40X^3 + 24X^5$

18) $15X^3Y + 20X^3Y^2 - 5X^4Y^4$

19) $[(13)^2 - 9] \div 20 =$

$$(169 - 9) \div 20 =$$

$$160 \div 20 = 8$$

20) $[7 - 2] \times 11 - 169 =$

$$5 \times 11 - 169 =$$

$$55 - 169 = -114$$

1E

1) $\frac{1}{9}$

2) $\frac{1}{10^8}$

3) 4^{A+B}

4) $11^{1-0} = 11^1 = 11$

5) 3^4D

6) 5^6

7) $B^{11}C^{-2}$

8) $C^{-6}D^{12}$

9) $7 \frac{9}{16}$

10) 10,000

11) $\left[-5 \frac{1}{2} Y - \frac{2}{9} = \frac{5}{18} \right] \times 18 =$

$-99Y - 4 = 5$

$-99Y = 9$

$Y = -1/11$

12) $[-.7A + .8A = 1.2] \times 10 \Rightarrow -7A + 8A = 12$
 $A = 12$

13) $\left[1 - \frac{2}{3} = -2 \frac{1}{4} + 1 - \frac{3}{5} A \right] \times 60 =$

$\left[\frac{5}{3} = -\frac{9}{4} + \frac{8}{5} A \right] \times 60 =$

$100 = -135 + 96A$

$235 = 96A$

$A = 235/96$

14) $[3X - 1.6 = .34] \times 100$

$300X - 160 = 34$

$300X = 194$

$X = 194/300 = 97/150$

15) $M(9 - 10M^2 + 19M)$

16) $-36M - 27M^2 =$
 $9M(-4 - 3M)$

17) $XA^4 + 2X^2A^4 - A^5$

18) $A^3B - 4A^2B^2 + 2AB^2$

19) $-19 - |-14| + 36 =$
 $-33 + 36 = 3$

20) $15 + 49 - 7 + 2 = 59$

2A

1) correct

2) correct

3) incorrect

$= \frac{X^2}{X^2 + 2X + 7} + \frac{3X}{X^2 + 2X + 7} + \frac{6}{X^2 + 2X + 7}$

4) incorrect = 2

5) $\frac{4X^2 + X}{X} = \frac{X(4X + 1)}{X} = 4X + 1$

6) $\frac{Y^2 + 2Y}{Y} = \frac{Y(Y + 2)}{Y} = Y + 2$

7) $\frac{4X + 4Y}{2} = \frac{4(X + Y)}{2} = 2X + 2Y$

8) $\frac{12AB + 16A^2}{4A} = \frac{4A(3B + 4A)}{4A} = 3B + 4A$

9) $\frac{5XY + 20XYZ}{5YZ} = \frac{5Y(X + 4XZ)}{5YZ} = \frac{X + 4XZ}{Z}$

10) $\frac{2X^2Y - XY^2}{XY} = \frac{XY(2X - Y)}{XY} = 2X - Y$

11) $\frac{6}{X+2} + \frac{4X}{X+2} = \frac{6+4X}{X+2}$

12) $\frac{3(X)}{4(X)} + \frac{(4)3}{(4)X} = \frac{3X + 12}{4X}$

13) $\frac{(Y)7}{(Y)4X} - \frac{(X)3}{(X)4Y} = \frac{7Y - 3X}{4XY}$

14) $\frac{(A)A}{(A)B} - \frac{(B)B}{(B)A} = \frac{A^2 - B^2}{AB}$

15) $\frac{3X(Y+1)}{(Y-1)(Y+1)} + \frac{2X(Y-1)}{(Y+1)(Y-1)} =$
 $\frac{3XY + 3X + 2XY - 2X}{(Y-1)(Y+1)} = \frac{5XY + X}{(Y-1)(Y+1)}$

16) $\frac{R}{T} + \frac{RS}{RT} = \frac{R+S}{T}$