

2B

$$1) \text{ incorrect} = \frac{9X + 3}{(X + 1)(X - 1)}$$

$$2) \text{ incorrect} = \frac{3}{4}$$

3) correct

4) correct

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

$$6) \frac{6X + 3A + 3X}{3} = \frac{9X + 3A}{3} = 3X + A$$

$$7) \frac{16X^3Y + 8X^2Y}{2XY} = \frac{2XY(8X^2 + 4X)}{2XY} = 8X^2 + 4X$$

$$8) \frac{ABC^2(AB^2C^2 - 1)}{AB} = C^2(AB^2C^2 - 1) \text{ or } AB^2C^4 - C^2$$

$$9) \frac{2R + 2}{(R + 1)} = \frac{2(R + 1)}{(R + 1)} = 2$$

$$10) \frac{5X^2 - 5A^2}{5A} = \frac{5(X^2 - A^2)}{5A} = \frac{X^2 - A^2}{A}$$

$$11) \frac{8(X - 2)}{(X + 2)(X - 2)} + \frac{-1(X + 2)}{(X - 2)(X + 2)} = \frac{7X - 18}{(X - 2)(X + 2)}$$

$$12) \frac{1(AB)}{2(AB)} + \frac{6(2)}{AB(2)} = \frac{AB + 12}{2AB}$$

$$13) \frac{8(B)}{2A(B)} - \frac{3(A)}{2B(A)} = \frac{8B - 3A}{2AB}$$

$$14) \frac{XY(X)}{Z(X)} + \frac{ZY(Z)}{XZ(Z)} = \frac{X^2Y + Z^2}{XZ}$$

$$15) \frac{(2)X^2}{(2)3} - \frac{(3)X}{(3)2} + \frac{(2)2}{(2)3} = \frac{2X^2 - 3X + 4}{6}$$

$$16) \frac{X(X + 1)}{Y(X + 1)} + \frac{3Y(Y)}{(X + 1)(Y)} = \frac{X^2 + X + 3Y^2}{Y(X + 1)}$$

2C

$$1) 1 - 1 = 0, \text{ correct}$$

$$2) \text{ incorrect, should be } \frac{2X}{X + 6} + \frac{3}{X + 6}$$

$$3) \frac{BX}{B} + \frac{BC}{B} = X + C$$

$$4) \frac{3XY^2}{2} - \frac{546}{2} = 3Y^2 - 6$$

$$5) \frac{4X^2Y}{2X} + \frac{2XY}{2X} = 4X^2Y + 2X$$

$$6) \frac{(2)A}{(2)B} + \frac{C}{2B} = \frac{2A + C}{2B}$$

$$7) \frac{(7)X}{(7)4} + \frac{(4)Y}{(4)7} = \frac{7X + 4Y}{28}$$

$$8) \frac{5 \cdot 5}{5 \cdot X} + \frac{X \cdot X}{X \cdot 5} = \frac{25 + X^2}{5X}$$

$$9) 6X^9$$

$$10) X^0 = 1$$

$$11) 10^{-8} \text{ or } \frac{1}{10^8}$$

$$12) X = 3$$

$$13) X^2$$

$$14) A^{-3} B^4$$

$$15) \left[2 \frac{1}{2} = \frac{2}{5} P - 1 \frac{3}{7} \right] 70 =$$

$$\left[\frac{5}{2} = \frac{2}{5} P - \frac{10}{7} \right] 70 =$$

$$175 = 28P - 100$$

$$\frac{275}{28} = \frac{28P}{28} \quad P = 9 \frac{23}{28}$$

$$16) [2X + .03X = .69] 100$$

$$20X + 3X = 69$$

$$23X = 69 \quad X = 3$$

$$17) -7B + 28 + 21B$$

$$18) X^2YZ + XY^2Z + XYZ^2$$

$$19) -4 \cdot 3^2 + 2 \cdot 5 - |6 - 22| =$$

$$-4 \cdot 9 + 2 \cdot 5 - 16 =$$

$$-36 + 2 \cdot 5 - 16 = -55$$

$$20) (6 + 3)^2 - (4 \cdot 8)^2 + 3 \div \frac{1}{3} =$$

$$81 - 16 + 3 \div \frac{1}{3} =$$

$$81 - 16 + 9 = 74$$

1E

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

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

3) $4A+B$

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

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

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

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

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

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

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

2B

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$$6) \frac{6X + 3A + 3X}{3} = \frac{\cancel{3}(2X + A + X)}{\cancel{3}} = 3X + A$$

$$7) \frac{16X^3Y + 8X^2Y}{2XY} = \frac{\cancel{2XY}(8X^2 + 4X)}{\cancel{2XY}} = 8X^2 + 4X$$

$$8) \frac{ABC^2(AB^2C^2 - 1)}{AB} = C^2(AB^2C^2 - 1) \text{ or } AB^2C^4 - C^2$$

$$9) \frac{2R + 2}{(R + 1)} = \frac{\cancel{2(R + 1)}}{\cancel{(R + 1)}} = 2$$

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$$1) 1 - 1 = 0, \text{ correct}$$

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$$3) \frac{\cancel{BX}}{\cancel{B}} + \frac{\cancel{BC}}{\cancel{B}} = X + C$$

$$4) \frac{\cancel{3}^3\cancel{2}^2Y^2}{\cancel{2}^2\cancel{3}^3} - \frac{\cancel{5}^5\cancel{4}^4}{\cancel{4}^4\cancel{5}^5} = 3Y^2 - 6$$

$$5) \frac{\cancel{4}^4\cancel{3}^3X^2Y^4}{\cancel{2}^2\cancel{3}^3} + \frac{\cancel{2}^2\cancel{4}^4XY^3}{\cancel{2}^2\cancel{3}^3} = 4X^2Y + 2X$$

$$6) \frac{(2)A}{(2)B} + \frac{C}{2B} = \frac{2A + C}{2B}$$

$$7) \frac{(7)X}{(7)4} + \frac{(4)Y}{(4)7} = \frac{7X + 4Y}{28}$$

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$$81 - 16 + 9 = 74$$

2D

1) incorrect $\frac{2}{6} + \frac{3}{6} = \frac{5}{6}$

2) correct

3) $\frac{4\cancel{X}^2}{\cancel{X}} - \frac{\cancel{X}^2}{\cancel{X}} = 4X^2 - X$

4) $\frac{(X+1)(\cancel{X-1})}{(\cancel{X-1})} = X+1$

5) $\frac{4\cancel{28}}{\cancel{X}} - \frac{2\cancel{14}A^2}{\cancel{X}} = 4 - 2A^2$

6) $\frac{8(X+2)}{(X+1)(X+2)} + \frac{10(X+1)}{(X+2)(X+1)} = \frac{18X+26}{X^2+3X+2}$

7) $\frac{7}{4Y} - \frac{9(2)}{2Y(2)} = \frac{7-18}{4Y} = \frac{-11}{4Y}$

8) $\frac{A \cdot C}{B \cdot C} + \frac{B \cdot B}{C \cdot B} = \frac{AC+B^2}{BC}$

9) $\frac{1}{8^5} \div 8^2 = \frac{1}{8^5} \times \frac{1}{8^2} = \frac{1}{8^7}$

10) $\frac{1}{(-\frac{1}{2})^3} = \frac{1}{-\frac{1}{8}} \cdot \frac{8}{1} = 8$

or $1 \div 1/8 = 1 \times 8/1 = 8$

11) 7^{-8} or $\frac{1}{7^8}$

12) $X=3$

$(1\,000\,000 = 10^6)$

13) $3A^2B^{-1}$

14) $\frac{B^3A^{-4}}{6}$ or $\frac{B^3}{6A^4}$ or $\frac{1}{6}B^3A^{-4}$

15) $\left[\frac{1}{2} - \frac{2}{5}P = \frac{3}{7} \right] 70 =$

$35 - 28P = 30$

$5 = 28P$

$P = 5/28$

16) $[7.2 - 3 = .07X] 100$

$720 - 300 = 7X$

$420 = 7X \quad X = 60$

17) $9XY(-8Y + 5X)$

18) $6A(3A - 4B^3)$

19) $(-6)^2 - 8N + 11 = -3$

$36 + 14 = 8N$

$50 = 8N$

$N = 50/8 = 6 \frac{1}{4}$

20) $B(6+6)^2 + |100 - 1^2| - 14 = 5 \cdot 9 + 4$

$B(12)^2 + |99| - 14 = 45 + 4$

$144B + 99 - 14 = 49$

$144B + 85 = 49$

$144B = -36$

$B = -\frac{1}{4}$

2E

1) correct

$\frac{X}{X} + \frac{3}{X} = 1 \frac{3}{X}$

2) incorrect

$\frac{2(X)}{X+1(X)} + \frac{3(X+1)}{X(X+1)} = \frac{5X+3}{X^2+X}$

3) $\frac{AX}{2} - \frac{6Y}{2} + \frac{6X}{2}$

$\frac{AX}{2} - 3Y + 3X$

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

5) $\frac{\cancel{6A}^2}{\cancel{12A}^2} + \frac{\cancel{8A}}{\cancel{12A}^2} = \frac{A}{2} + \frac{1}{2}$

6) $\frac{4(3)}{X(3)} + \frac{1(X)}{3(X)} = \frac{12+X}{3X}$

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

8) $\frac{3Q}{(Q+1)Q} + \frac{2(Q+1)}{Q(Q+1)} = \frac{3Q+2Q+2}{(Q+1)(Q)} =$

$\frac{5Q+2}{(Q+1)(Q)}$

9) $32X^2$

10) 1

11) $(5^8)^{-3} = 5^{-24} = \frac{1}{5^{24}}$

12) 7^6

13) $X^6X^{-8} = X^{-2}$

14) $P^8P^2 = P^{10}$

15) $[.024F + F = .56] \times 1000$
 $24F + 1000F = 560$
 $F = 35/64$

16) $\left[10 \frac{2}{3}B + 3 \frac{1}{6} = 1 \frac{7}{8} \right] 24 =$

$\left[\frac{32}{3}B + \frac{19}{6} = \frac{15}{8} \right] 24 =$

$256B + 76 = 45$

$256B = -31$

$B = -31/256$

17) $230X - 7Y$

18) $9A + 20 + 3,000 =$
 $9A + 3,020$

19) $(2/3)2 - 9Y = 8(Y+3)$

$4/3 - 9Y = 8Y + 24$

$-22 \frac{2}{3} = 17Y$

$\frac{1}{17} \times \frac{-68}{3} = 17Y \times \frac{1}{17}$

$Y = \frac{-68}{51} = -\frac{4}{3}$

20) $49 \div 7 - 6 = 14R - 28R$

$7 - 6 = -14R$

$R = -1/14$