

2B

$$1) 16 = 2 \times 2 \times 2 \times 2$$

$$18 = 2 \times 3 \times 3$$

$$\text{LCM} = 2 \times 2 \times 2 \times 3 \times 3 = 144$$

$$2) 10 = 2 \times 5$$

$$14 = 2 \times 7$$

$$\text{LCM} = 2 \times 5 \times 7 = 70$$

$$3) 24 = 2 \times 2 \times 2 \times 3$$

$$50 = 2 \times 5 \times 5$$

$$\text{LCM} = 2 \times 2 \times 2 \times 3 \times 5 \times 5 = 600$$

$$4) 4 \cdot 8 + 3^2 = (4 \cdot 8) + 9 = 32 + 9 = 41$$

$$5) 10 \cdot 4^2 - 25 = (10 \cdot 16) - 25 = 160 - 25 = 135$$

$$6) 7^2 - 9 \div 2 = 49 - (9 \div 2) = 49 - 4.5 = 44.5$$

$$7) 18 \cdot 2 + 5^2 - 11 = (18 \cdot 2) + 25 - 11 = 36 + 25 - 11 = 50$$

$$8) 15 \div 3 \cdot 8 + 10 = (5 \cdot 8) + 10 = 40 + 10 = 50$$

$$9) (-5)^2 + (9 + 4^2) = 25 + (9 + 16) = 25 + 25 = 50$$

$$10) 9^2 + 48 \div 12 - 3^3 = 81 + (48 \div 12) - 27 = 81 + 4 - 27 = 58$$

$$11) |4^2 - 9| + (8 \div 4)^2 = |4^2 - 9| + (2)^2 = |16 - 9| + 4 = 7 + 4 = 11$$

$$12) |3^2 - 5^2| \cdot (15 \div 3)^3 + 18 = |3^2 - 5^2| \cdot (5)^3 + 18 = |9 - 25| \cdot 125 + 18 = |-16| \cdot 125 + 18 = 16 \cdot 125 + 18 = -91$$

$$13) |10^2 - 5^2| + |-8 + 2^2| = |100 - 25| + |-8 + 4| = |75| + |-4| = 75 + 4 = 79$$

$$14) |18 - 36| + (|3 - 5^2| - 15)^2 = |18 - 36| + (|3 - 25| - 15)^2 = |-18| + (|-22| - 15)^2 = 18 + (22 - 15)^2 = 18 + 7^2 = 67$$

$$15) |(-10)^2 - 9| - |2^4 \cdot 5^2| = |100 - 9| - |16 \cdot 25| = |91| - |9| = 91 - 9 = 82$$

2C

$$1) 4 \cdot 7 + 3^2 = (4 \cdot 7) + 9 = 28 + 9 = 37$$

$$2) 5^2 + 8 \div 2 = 25 + 8 \div 2 = 25 + 4 = 29$$

$$3) 12^2 \times (2 + 3) \cdot 4 = (144 \times 5) \cdot 4 = 720 \cdot 4 = 716$$

$$4) 9 \times 1^2 - 8 = (9 \times 1) - 8 = 9 - 8 = 1$$

$$5) 14 \div 2 \cdot 1 \times 6 = 7 \cdot 6 = 1$$

$$6) 6 + 28 \div 7 \cdot 4^2 = 6 + 28 \div 7 \cdot 16 = 6 + 4 \cdot 16 = -6$$

$$7) (-3)^2 \div 9 + 6 = 9 \div 9 + 6 = 1 + 6 = 7$$

$$8) |6 \div (-2)| \times 5 + 3^2 = |-3| \times 5 + 9 = 3 \times 5 + 9 = 15 + 9 = 24$$

$$9) \frac{1}{2} \times \frac{1}{5} \times \frac{1}{1} = \frac{1}{10}$$

$$10) \frac{1}{1} \times \frac{1}{1} \times \frac{1}{1} \times \frac{1}{5} = \frac{1}{5}$$

$$11) 2 \times 2 \times 2 \times 2 \times 2 \times 2$$

$$12) 3 \times 3 \times 3 \times 3$$

$$13) \frac{32}{48} = \frac{2 \times 16}{3 \times 16} = \frac{2}{3} \quad 16 \text{ is GCF}$$

$$14) 24 = 2 \times 2 \times 2 \times 3$$

$$36 = 2 \times 2 \times 3 \times 3$$

$$\text{LCM} = 2 \times 2 \times 2 \times 3 \times 3 = 72$$

$$15) \frac{2}{3} \div \frac{2}{7} = \frac{14}{21} \div \frac{6}{21} = \frac{14}{6} = 2 \frac{1}{3}$$

$$16) \frac{2}{3} \div \frac{2}{7} = \frac{2}{3} \times \frac{7}{2} = \frac{14}{6} = 2 \frac{1}{3}$$

$$17) .7 \times .3 = .21 \quad (\text{because } 1/10 \times 1/10 = 1/100)$$

$$18) 2.4 \times 1.2 = 2.88 \quad (\text{see note for \#17})$$

$$19) 1.3 \times 2.1 = 2.73 \quad (\text{see note for \#17})$$

$$\text{or } \begin{array}{r} 1.3 \\ 2.1 \\ \hline 13 \\ 26 \\ \hline 2.73 \end{array} \quad (\text{two decimal places in answer})$$

$$20) .4 \times 3.2 = 1.28$$

Solutions 2A - 2C

2D

$$1) -4^2 + (7 - 3)^2 - |-2| = -16 + (4)^2 - 2 = -16 + 16 - 2 = -2$$

$$2) 4(10 - 3) - 5(6) + 8 \div 2 = 4(7) - 30 + 4 = 28 - 30 + 4 = 2$$

$$3) -19 - (7)(-2) + 6^2 = -19 - (-14) + 36 = -19 + 14 + 36 = 31$$

$$4) -(A - B) + A - B = (-A + B) + A - B = (-A + A) + (B - B) = 0$$

$$5) 11^2 \div 4 + 2/3 = 121 \div 4 + 2/3 = 121/4 + 2/3 = 363/12 + 8/12 = 371/12 \quad \text{or } 30 \frac{11}{12}$$

$$6) 5 \times 3 + 4^2 - 7 + (-8 \div 4) = 5 \times 3 + 16 - 7 + (-2) = 15 + 16 - 7 - 2 = 22$$

$$7) -5^2 + (-5)^2 = -25 + 25 = 0$$

$$8) |(9^2 \div 9) \div 3| = |(81 \div 9) \div 3| = |9 \div 3| = 3$$

$$9) \frac{1}{2} \times \frac{1}{5} \times \frac{1}{1} = \frac{1}{10}$$

$$10) \frac{5}{24} = \frac{20}{96}$$

$$+ \frac{9}{32} = \frac{27}{96}$$

$$\hline \frac{47}{96}$$

LCM is 96.

$$11) (3 \times 4) \times 6 = 3 \times (4 \times 6)$$

$$12 \times 6 = 3 \times 24$$

$$72 = 72$$

$$12) \text{yes, see \#11}$$

$$13) 10 - (8 - 6) \neq (10 - 8) - 6$$

$$10 - 2 \neq 2 - 6$$

$$8 \neq -4$$

$$14) \text{no, see \#13}$$

$$15) \frac{12}{7} \div \frac{7}{4} = \frac{48}{28} \div \frac{49}{28} = \frac{48}{49}$$

$$16) \frac{12}{7} \div \frac{7}{4} = \frac{12}{7} \times \frac{4}{7} = \frac{48}{49}$$

$$17) \begin{array}{r} 38.33 \\ .06 \overline{) 2.3000} \\ \underline{180} \\ 50 \\ \underline{48} \\ 20 \\ \underline{18} \\ 20 \\ \underline{18} \end{array}$$

$$18) \begin{array}{r} 5 \\ 5 \overline{) 2.5} \\ \underline{25} \end{array}$$

$$19) \begin{array}{r} 50 \\ .05 \overline{) 2.50} \\ \underline{25} \\ 0 \end{array}$$

$$20) \begin{array}{r} .2 \\ 53 \overline{) 1.06} \\ \underline{106} \\ 0 \end{array}$$

2E

$$1) -3 + 2^3 - 8 + 7^2 = -3 + 8 - 8 + 49 = 46$$

$$2) (5 \times 6) \div 3 = 30 \div 3 = 10$$

$$3) [(10 + 3)^2 - 9] \div 20 = [13^2 - 9] \div 20 = [169 - 9] \div 20 = 160 \div 20 = 8$$

$$4) A + B + 2A - 3B = (A + 2A) + (B - 3B) = 3A - 2B$$

$$5) [42 \div 6 - 2] \times 11 = [7 - 2] \times 11 = 5 \times 11 = 55$$

$$6) 8 + 45 \div 9 + 3 = 8 + 5 + 3 = 16$$

$$7) (-4)^2 + (5)^2 - 3^2 = 16 + 25 - 9 = 32$$

$$8) (192 \div 8) \times 4 - 67 - 200 = 24 \times 4 - 133 = 96 - 133 = -37$$

$$9) \frac{5}{3} \times \frac{7}{4} \times \frac{7}{12} = \frac{245}{72} = 3 \frac{29}{72}$$

$$10) \frac{3}{7} \times \frac{11}{13} = \frac{39}{91} + \frac{77}{91} = \frac{116}{91} = 1 \frac{25}{91}$$

Cross multiplication always yields a correct answer for addition of fractions. In some cases, you will have to reduce after finding the answer.

$$11) \frac{30}{54} = \frac{5 \times 6}{9 \times 6} = \frac{5}{9} \quad 6 \text{ is GCF}$$

$$12) 10 = 10$$

$$100 = 10 \times 10$$

$$\text{LCM} = 10 \times 10 = 100$$

(LCM may also be found using prime factors)

$$13) 6 + 2 + 9 = 2 + 6 + 9$$

$$8 + 9 = 8 + 9$$

$$17 = 17$$

$$14) \text{yes, see \#13}$$

$$15) \frac{37}{8} \div \frac{11}{4} = \frac{37}{8} \times \frac{22}{11} = \frac{37}{2} = 1 \frac{15}{22}$$

Either method may be used for dividing fractions)

$$16) \begin{array}{r} .45 \\ 3.1 \overline{) 1.395} \\ \underline{124} \\ 155 \\ \underline{155} \end{array}$$

$$17) \frac{14}{3} \div \frac{5}{4} = \frac{56}{12} \div \frac{15}{12} = \frac{56}{15}$$

$$3 \frac{11}{15}$$

$$18) \begin{array}{r} .004 \\ .4 \overline{) .0016} \\ \underline{16} \end{array}$$

$$19) \begin{array}{r} 3 \text{ groups of } \$.40 \\ .4 \overline{) 1.2} \end{array}$$

$$20) \begin{array}{r} \$.24 \text{ per person} \\ 6 \overline{) 1.44} \\ \underline{12} \\ 24 \end{array}$$

Solutions 2D - 2E