Number Sense – AP Book 7, Part 1: Unit 1

AP Book NS7-1

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1. hundred billions,
   ten billions,
   billions

2. a) 2<u>5</u>0 329 120
   b) 7<u>9</u>1 250 329 120
   c) 791 <u>2</u>50 329 120
   d) 791 250 32<u>9</u> 120
   e) 79<u>1</u> 250 329 120
   f) 791 250 <u>3</u>29 120

3. c) hundred millions
   d) hundred billions
   e) ten millions
   f) billions

4. b) 76 312 098 532
      hundreds
   c) 995 132 498 763
      billions
   d) 3 542 706
      hundred thousands
   e) 5 410 328
      millions
   f) 841 073 521 960 347
      hundred millions

5. a) 300 000 + 70 000
      + 8 000 + 400 + 3
   b) 10 000 + 6 000
      + 20 + 5
   c) 700 000 + 20 000
      + 1 000 + 800 + 3

6. a) 34 053
   b) 600 030
   c) 40 205

7. a) 20
   b) 5 000

8. a) 89 0345 8236 7121;
      14 digits
      8 9043 5823 9121;
      13 digits
   b) Yes
   c) 89 0345 8236 7121
      (circled) is larger
      because it has
      more digits than
      8 9043 5823 9121.

9. a) 84 <u>3</u>12
   b) 74 31<u>4</u> 873
   c) <u>7</u> 860 432

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d) 531 6<u>62</u>

10. a) 5 412 679
    b) 984 125 108
    c) 654 092 800
    d) 45 678 098 531

11. a) 20
    b) 20
    c) 20
    d) 20
    e) 20
    f) 20
    g) 200
    h) 2 000
    i) 20 000
    j) 20 000
    k) 200 000
    l) 20 000
    BONUS 5 000 000

12. a) five million
       two hundred
       ten thousand
       three hundred
       fifty-four
    b) five hundred
       seventy-three million
       three hundred
       twelve thousand
       four hundred
    c) five hundred
       seventy-six billion
       four hundred one
       million
       three hundred
       eleven thousand
       two hundred
       twelve
    d) thirty-one billion
       four hundred
       eighty-five million
       six hundred twenty
       thousand
       four hundred
       seventeen

AP Book NS7-2

page 3

1. b) 6
   c) 14
   d) 5

2. a) i) 10; 15

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    ii) 11; 15
   b) No

3. a) i) 1
      ii) 5
   b) Yes

4. a) i) 18
      ii) 18
      iii) 20
      iv) 18
      v) 18
      vi) 20
   b) Two (18, 20)

5. a) i) Answer will
         always be 26.
      ii) Answer could
         be 4, 6, or 10.
      iii) Answer could
         be 18 or 20.
      iv) Answer could
         be 4, 6, 10
         or 12.
   b) i) 1
      ii) 2
      iii) 3
      iv) 4
   c) ☐ addition only
      ☑ subtraction only
      ☑ addition and
         subtraction

6. a) 14
   b) 4
   c) 1
   d) 4

7. a) i) Answer will
         always be 60.
      ii) Answer could
         be 1, 4, 16
         or 64.
      iii) Answer could
         be 1, 9 or 36.
   b) expression i)

8. b) 28
   c) 7
   d) 12
   e) 2
   f) 12
   g) 3

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    h) 8

9. All boxes are checked.

10. a) 1
    b) 4
    c) 0
    d) 18
    e) 17
    f) 1
    g) 7
    h) 18
    i) 4
    j) 12
    k) 13
    l) 2

11. b) $(9 - 6) \times 2 + 4$
    c) $40 - 6 \times 5 + 5$
    d) $4 \div 2 + 10 - 4$
    e) $6 \div 3 + 5 - 3$
    BONUS
    $(8 \div 4 + 2) \times (5 + 3)$

12. b) Add 6 and 1. Then
       multiply by 2.
    c) Subtract 1 from 3,
       then add 5. And
       then multiply by 4.
    d) Multiply the result
       of subtracting 2
       from 5 by the result
       of adding 4 to 17.
    e) Multiply 2 by 6 and
       subtract the result
       from 24. Divide this
       answer by 4.
    f) Multiply 2 by 6 and
       divide the result by
       4. Then subtract the
       answer from 24.

13. a) i) Answer could
         be 8, 20 or 26.
      ii) Answer could
         be −24, 0, 16,
         32, or 120.
      iii) Answer could
         be 0.4, 1, 10,
         16, or 40.
    b) i) 3
       ii) 5
       iii) 5

14. i) 8 – 5 – 2

ii) 7 – 3 + 2

iii) 7 + 5 – 2

iv) 6 + 2 + 4

15. a) 24 ÷ 6 ÷ 2

b) 5 × 8 ÷ 4 × 2

c) 5 × 8 ÷ 4 ÷ 2

16. a) 4 × 6 ÷ (3 × 2) →
4 × 6 ÷ 3 ÷ 2

4 × (6 + 3) × 2 →
4 × 6 × 2 + 4 × 3 × 2

(4 + 6) × (3 + 2) →
4 × 3 + 4 × 2 + 6 × 3
+ 6 × 2

b) (4 + 6) × (3 + 2)

AP Book NS7-3
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1. a) 8

b) 12

c) 8

d) 7

2. a) a) and c)

b) 1 + 3 + 4
= 2 × 2 × 2

3. b) 60 = 60

c) 21 = 21

4. a) 17 = 6 + 11

b) 17 = 7 + 10

c) 17 = 8 + 9

5. b) (7 – 2) + (4 + 2)
= 7 + 4

c) (8 + 2) + (7 – 2)
= 8 + 7

d) (8 – 5) + (9 + 5)
= 8 + 9

6. b) 7

c) 2

7. a) 11 – 6 = 5

b) 7 – 4 = 3

c) 5 – 3 = 2

8. a) 3

b) 5

c) 2

d) 7

9. a) +

b) –

c) +

d) –

10. a) ii) + 4
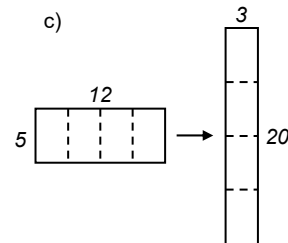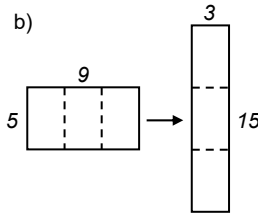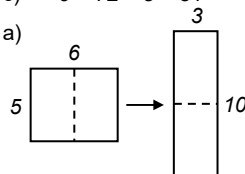
iii) + 4

iv) – 3

v) + 7

vi) – 6

b) Teacher to check.

BONUS

a) (3 + 1) × (7 – 2)
= 20

b) (3 + 1) × 7 – 2 = 26

c) 3 + 1 × 7 – 2 = 8

d) (6 – 3) × 2 = 6

e) 16 ÷ (2 × 2) = 4

f) (4 + 8) ÷ 2 = 6

g) (8 – 4) × (2 + 5)
= 28

h) (8 – 4) × 2 + 5 = 13

i) 5 × (4 – 3) + 2 = 7

AP Book NS7-4
page 8

1. b) 12

c) 10

d) 21

e) *a* × *b*

2. b) 10 and 7; 5 and 14

c) 12 and 4; 6 and 8

3. b) 11 and 24

c) 44 and 6

4. a) 8 × 5

b) 2 × 20

5. a) 10 × 28 = 7 × 40

b) 4 × 24 = 6 × 16

c) 21 × 248
= 84 × 62

6. a) 5 × 63 = 7 × 45

b) 4 × 45 = 5 × 36

c) 9 × 72 = 8 × 81

7. a)

b)

c)

8. a) 2

b) 3

c) 4

d) 3

e) 4

f) 2

9. a) ÷

b) ÷

c) ÷

10. b) ÷ 10

c) ÷ 5

11. We can turn one expression into another by multiplying one of the factors by a number and dividing the other by the same number.
Solution: 4 × 100 = 400

12. a) 30

b) 24

c) 144

d) 126

13. a) 10 × 3 = 30

b) 15 × 5 = 75

c) 4 × 25 = 100

d) 2 × 30 = 60

e) It is also multiplied by 5.

14. b) × 2

c) × 7

15. (30 × 3) ÷ (6 × 3)

(30 × 4) ÷ (6 × 4)

16. × 2

× 3

× 4

17. a) × 2

b) × 2

c) × 5

18. We can turn one expression into another by multiplying or dividing both factors by the same number.
Solution: 70 ÷ 10 = 7

19. a) 27

b) 240; 24

c) 130; 13

20. (60 ÷ 3) ÷ (12 ÷ 3)

(60 ÷ 4) ÷ (12 ÷ 4)

21. a) ÷ 2

b) ÷ 3

c) ÷ 4

22. a) ÷ 2

b) ÷ 3

23. a) + 2

b) – 2

c) ÷ 3

d) × 3

e) ÷ 3

f) 7 ×

g) + 4

h) ÷ 2

i) × 2

BONUS

j) × *p*

k) × *m*

l) + *t*

AP Book NS7-5
page 12

1. a) ●●●
3

b) ●●●●●●●
7

c) ●●
2

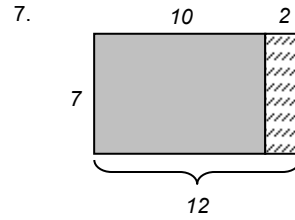d) ●●●●●
5

2. 34 716; 34 716

   When you multiply any number by 1 the result is that number.

3. a) 1
   b) 1
   c) 6
   d) 12

4. a) 1
   b) 854 302

5. a) 0
   b) 0
   c) 0

6. Factors: 2 1 0
   Products: 10 5 0
   ∴ 0 × 5 = 0

7. Factors: 2 1 0
   Products: 6 3 0
   ∴ 0 × 3 = 0

8. a) 0
   b) 0
   c) 0
   d) 0

9. 0

   If one or more of the factors is 0, the answer is always 0.

10. a) 1
    b) 2
    c) 3
    d) 4

11. a) 0
    b) No
    c) No, because there is not a number multiplied by 0 that equals 7… division by 0 is undefined.

12. a) Too many answers
    b) No answers

13. d) 0
    e) 1
    f) No answer
    g) 0
    h) Too many answers
    i) 1
    j) No answer

k) No answer
l) Too many answers

AP Book NS7-6
page 14

1. a) 1 + 6   4 + 3
      2 + 5   5 + 2
      3 + 4   6 + 1
   b) They are in the opposite order top to bottom.

2. a) 3 × 7
      = 3 × 1 + 3 × 6
      3 × 7
      = 3 × 2 + 3 × 5
      3 × 7
      = 3 × 3 + 3 × 4
      3 × 7
      = 3 × 4 + 3 × 3
      3 × 7
      = 3 × 5 + 3 × 2
      3 × 7
      = 3 × 6 + 3 × 1
   b) The products are simply written in the opposite order (e.g. $a × b$ versus $a × b$).

3. a) 12 = 4 + 48
      11 = 8 + 44
      10 = 12 + 40
      9 = 16 + 36
      8 = 20 + 32
      7 = 24 + 28

      The order of the products simply reverses:
      4 × 6 + 4 × 7
      = 4 × 7 + 4 × 6
   b) 52;
      Answers will vary—teacher to check.
   c) Teacher to check.

4. a) =
   b) =
   c) ≠
   d) ≠

5. 5 × 8; 5 × 2
   Area = 5 × (8 + 2) and
   Area = 5 × 8 + 5 × 2
   So:
   5 × (8 + 2) = 5 × 8 + 5 × 2

6. 5 × 8; 5 × 2
   Area = 5 × (8 − 2) and
   Area = 5 × 8 − 5 × 2
   So:
   5 × (8 − 2) = 5 × 8 − 5 × 2

7.

8. Area = (5 + 3) × (7 + 2) and
   Area = 5 × 7 + 5 × 2 + 3 × 7 + 3 × 2
   So:
   (5 + 3) × (7 + 2) = 5 × 7 + 5 × 2 + 3 × 7 + 3 × 2

9. a) = 10 × 10 + 10 × 3 + 2 × 3 + 10 × 2
      = 100 + 30 + 6 + 20
      = 156
   b) = 4 × 7 + 8 × 7 + 4 × 6 + 8 × 6
      = 28 + 56 + 24 + 48
      = 156
   c) Yes
   d) The first way was easier because it's easier to multiply by ten.

AP Book NS7-7
page 17

1. a) 2; 6; 60
   b) 2; 6; 600
   c) 6 000
   d) 60 000
   e) 600 000
   f) 2 100
   g) 20 000
   h) 600 000

2. a) 3;
      100 + 15;
      115
   b) 400, 30, 2;
      800 + 60 + 4;
      864
   c) 3 × 300 + 3 × 10 + 3 × 2;
      900 + 30 + 6;
      936

3. a) 36
   b) 156
   c) 186
   d) 147
   e) 155
   f) 1 863
   g) 2 055
   h) 1 896

4.

	4	5	6	7	8	9	10
× 2	8	10	12	14	16	18	20
× 10	40	50	60	70	80	90	100
× 12	48	60	72	84	96	108	120

5.

	4	5	6	7	8	9	10
× 3	12	15	18	21	24	27	30
× 20	80	100	120	140	160	180	200
× 23	92	115	138	161	184	207	230

AP Book NS7-8
page 18

1. a) 188
   b) 249
   c) 148
   d) 126
   e) 276

2. b) 3, 0
   c) 1, 5
   d) 1, 8
   e) 4, 5

3. a) 72
   b) 315
   c) 75
   d) 365

e) 445

4. a) 280
    b) 210
    c) 105
    d) 200
    e) 120

5. a) 205
    b) 868
    c) 936
    d) 248
    e) 969

6. a) 681
    b) 580
    c) 672
    d) 595
    e) 984

7. a) 1 185
    b) 2 268
    c) 1 056
    d) 3 724
    e) 1 704
    f) 870
    g) 2 247
    h) 792
    i) 4 788
    BONUS   249 960

8. a) 315, 3 150
    b) 147, 1 470
    c) 2 800
    d) 4 680
    e) 1 800
    f) 3 180
    g) 2 370

9. a) 72
    b) 297
    c) 208
    d) 80

10. a) 1 360
    b) 3 450
    c) 1 560
    d) 1 340

11. a) 210, 7 00
    b) 128, 1 600
    c) 225, 1 350
    d) 32, 640

12. a) 1 104
    b) 4 028
    c) 1 975
    d) 988

13. a) 185, 74*0*; 925
    b) 207, 3 45*0*; 3 657
    c) 148, 3 700; 3 848
    d) 108, 1 620; 1 728
    e) 261, 1 740; 2 001
    f) 105, 700; 805
    g) 64, 3 200; 3 264
    h) 75, 1 000; 1 075
    i) 84, 960; 1 044
    BONUS
    1 956, 45 640, 260 800;
    308 396