MATH 100: CLASS DISCUSSION

11 SEPTEMBER 2018

algebraic operations continued; intro to linear equations

[Hall & Knight, **Elementary Algebra**]

I Review:

1. A trader gains \$20, loses \$43, and then gains \$10. Express algebraically the result of her transactions.
2. A Centigrade thermometer rises to 9° in the daytime and falls 15° during the night; what is the night reading?
3. A snail climbs 6 feet vertically upwards from a given point on a wall, slips down 15 feet, and then climbs 6 feet upwards again. Express algebraically its final position from its starting point.
4. Each of three football teams plays 20 matches during the season. The A team wins 9 and loses 5, the B team wins 6 and loses 8, and the C team wins 9 and loses 9, the other games being drawn. If one point be allowed for a win, and one point deducted for a loss, place the three teams in order of merit and give the expressions that denote the results of the season's play.
5. Find the sum of: $5a, 7a, 11a, a, 23a$
6. Find the sum of: $7ab, -3ab, -5ab, 2ab, ab$
7. Simplify fully: $3a^3 - 7a^3 - 8a^3 + 2a^3 - 11a^3$
8. Simplify fully: $-\frac{5}{3}x^2 - \frac{3}{4}x^2 - \frac{4}{3}x^2 - \frac{1}{4}x^2 - x^2$
9. Simplify: (a) $(x^3)^4$
   (b) $(y^6y^8(y^3)^2)^5$
   (c) $4(x^3y^2)^7(2y^2x)^5y^9x$
10. Find the sum of: $a + 2b - 3c;\ -3a + b + 2c;\ 2a - 3b + c$
11. Find the sum of: $20p + q - r;\ p - 20q + r;\ p + q - 20r$
12. Find the sum of: $pq + qr - rp;\ -pq + qr + rp;\ pq - qr + rp$
13. Add together: $3x^3 + 7 + 6x - 5x^2;\ 2x^2 - 8 - 9x;\ 4x - 2x^3 + 3x^2;$ $3x^3 - 9x - x^2;\ x - x^2 - x^3 + 4$
14. Find the sum of: $a^3 - ab + bc;\ ab + b^3 - ca;\ ca - bc + c^3$
15. Add together the following expressions: $\frac{1}{2}a - \frac{1}{3}b;\ -a + \frac{2}{3}b;\ \frac{3}{4}a - b$

16. Find the sum of: $\frac{1}{2}a^3 - 2a^2b - \frac{3}{2}b^3$; $\frac{3}{2}a^2b - \frac{3}{4}ab^2 + 2b^3$; $-\frac{3}{2}a^3 + ab^2 + \frac{1}{2}b^3$

17. Subtract 4a – 3b + c from 2a – 3b – c

18. Subtract -10x – 14x + 15z from x – y – z

19. From 3ab + 5cd – 4ac – 6bd take 3ab + 6cd – 3ac – 5bd

20. Subtract $x^3 – x^2 + x + 1$ from $x^3 + x^2 – x + 1$

21. Distinguish between *like* and *unlike* terms. Select the like terms in the expression $a^3 – 3ab + b^2 – 2a^3 – a^2 + 3b^2 + 5ab + 7a^2$.

22. Albertine works x + y sums, of which only y – 2z are right; how many are wrong?

23. If x represents the date 10 A.D. what will -3x stand for?

24. Add together $3x^2 – 7x + 5$ and $2x^3 + 5x – 3$, and diminish the result by $3x^2 + 2$.

25. Express in algebraical symbols the excess of the sum of *a* and *b* over *c* diminished by *d*.

26. Odette walks 2a – b miles due North from a fixed point O, and then walks a distance 3a + 2b miles due South; what is her final position with regard to O?

27. What expression must be added to $5x^2 – x + 2$ to produce $7x^2 – 1$.

II Linear equations. Solve each of the following linear equations for the indicated variable.

1. $8x – 8 = x + 12$
2. $5(x – 3) – 7(6 – x) + 3 = 24 – 3(8 – x)$
3. $7(25 – x) – 2x = 2(3x – 25)$
4. $5x – 17 + 3x – 5 = 6x – 7 – 8x + 115$
5. $x – [3 + \{x – 3(3 + x)\}] = 5$
6. $14x – (5x – 9) – \{4 – 3x – (2x – 3)\} = 30$
7. $(x + 1)(2x + 1) = (x + 3)(2x + 3) – 14$
8. $(x + 1)(2x + 3) = 2(x + 1)^2 + 8$

III Symbolic Expressions revisited

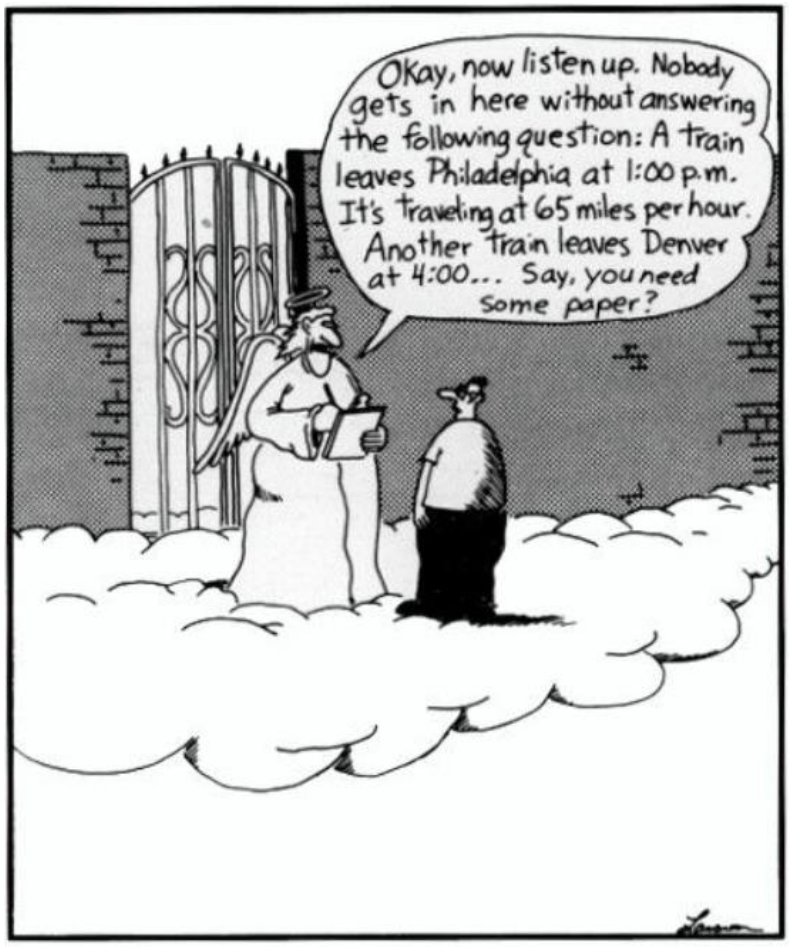
1. If 100 be divided into two parts and one part be *x* what is the other?
2. If the sum of two numbers be *c* and one of them is 20, what is the other?
3. What is the cost in dollars of 40 books at *x* dimes each?
4. In *x* years a turtle will be 149 years old; what is its present age?
5. How many hours will it take to walk *x* miles at 4 miles an hour?
6. By how much does 2x – 5 *exceed* x + 1?

7. A bookshelf contains *x* Latin, *y* Greek, and *z* English books: if there are 100 books, how many are there in other languages?
8. What is the price in dimes of 120 apples, when the cost of two dozen is *x* cents?
9. If *x* guys take 5 days to reap a field, how long will one guy take?
10. I have *x* dollars in my purse, *y* dimes in one pocket, and *z* cents in another; if I give away a half-dollar how many cents have I left?
11. The digits of a number from the left are *a, b, c*; what is the number?
12. Write down four *consecutive* numbers of which *x* is the least.
13. Write down three consecutive numbers of which *y* is the greatest.
14. What is the next even number after 2n?
15. What is the odd number next before 2x + 1?
16. Albertine makes a journey of *x* miles. She travels *a* miles by coach, *b* by train, and finishes the journey by boat. How far does the boat carry her?
17. If Dmitry was *x* years old 5 years ago, how old will he be *y* years hence?
18. What is the age of a man who *y* years ago was *m* times as old as a child then aged *x* years?
19. A's age is double B's, B's is three times C's, and C is *x* years old; find A's age.
20. A room is *x* yards in length and *y* feet in breadth; how many square feet are there in the area of the floor?
21. What is the cost in dollars of carpeting a room *a* yards long, *b* feet broad, with carpet costing *c* dimes a square yard?
22. How many miles can Gilberte walk in 45 minutes if she walks *a* miles in *x* hours?

III Problems leading to simple equations

1. One number exceeds another by 5, and their sum is 29; find them.
2. The difference between two numbers is 8; if 2 be added to the greater the result will be three times the smaller: find the numbers.
3. Albertine walks 10 miles, then travels a certain distance by train, and then twice as far by coach. If the whole journey is 70 miles, how far does she travel by train?
4. Twenty-three times a certain number is as much above 14 as 16 is above seven times the number: find it.
5. Divide $47 among A, B, C, so that A may have $10 more than B, and B $8 more than C.
6. The difference between the squares of two consecutive numbers is 121; find the numbers.
7. A sum of $7 is made up of 46 coins which are either quarters or dimes: how many are there of each?

8. A father is four times as old as his son; in 24 years he will only be twice as old. Find their ages.
9. A's age is six times B's, and fifteen years hence A will be three times as old as B: Find their ages.



Math phobic's nightmare