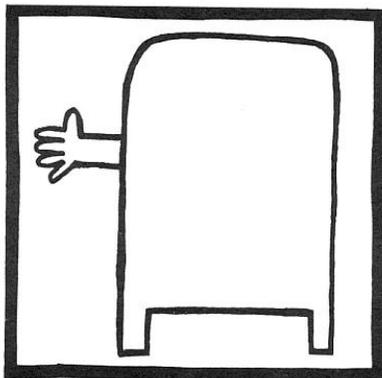# Droodle #16 – Evaluating Formulas & Solving Equations
A Puzzle by David Pleacher

Can you name this droodle?

Back in 1953, Roger Price invented a minor art form called the Droodle, which he described as "a borkley-looking sort of drawing that doesn't make any sense until you know the correct title."   The droodle above was drawn by Roger Price and published in his book called, *Droodles*.

To determine the title to this droodle, you must first evaluate the 16 formulas in the puzzle and find the corresponding answers.   Then replace each numbered blank in the puzzle below with the letter corresponding to the answer for that problem and that will give you the title.

Here is the title of this droodle:

 __ __ __   __ __   __ __ __ __ __ __ __ __ __ __ __ __
  3 12 15   14 15   16 13 11 16 14 10 13 16 12   8   7 16

 __ __ __ __ __ __ __ __ __   __ __ __   __ __ __ __
  1 14 10 15 12   5 14 15 10   11   7 16   5 13 11   8

 __ __ __ __
  8   4 16 15

Units have been omitted from the answers because they would make the choices too obvious.

Formulas:

___ 1. Usain Bolt is regarded as the fastest person on the planet. In 2009, he ran the 100 meters in
9.58 seconds (a world record). How fast was he traveling in miles per hour?
The formula to determine your speed in miles per hour for a particular race that you ran:

$$MPH = \frac{3600m}{1609t}$$ where m = distance run in meters and t is time in seconds

___ 2. Walter Johnson is considered by many to be the greatest major league pitcher of all time. For
his career, he pitched 5,914.67 innings and allowed 1,426 earned runs. What was his E.R.A.?
The formula for a Pitcher's Earned Run Average is given by:

$$ERA = \frac{(ER)(9)}{IP}$$ where ER = Earned Runs, IP is the number of innings pitched

___ 3. The World Ice Art Championships in Fairbanks, Alaska is home to the largest **ice sculpting**
competition in the world. The thickest ice that was ever harvested was 54 inches thick.
How much would a cube of ice weigh if each edge was 54 inches?
The formula to determine the weight of a cube of ice is given by:

$$W = .033e^3$$ where e = the edge of the cube in inches

___ 4. A thunderstorm is 8 miles in diameter. Estimate how long the storm will last.

$$t = \sqrt{\frac{d^3}{216}}$$ where d = the diameter of the storm in miles

and t = time in hours

___ 5. In 2013, the Colorado State Women's Volleyball Team had the sixth best Hitting Percentage in
the country. If they had 1,574 kills, 475 errors, and 3,674 total attack attempts, what was their
hitting percentage? Use the following formula:

$$HP = \frac{K-E}{TA}$$ where HP = Attack Percentage or Hitting Percentage,

K = Kills, E = Attack Errors, and TA = Total Attack Attempts

___ 6. In volleyball, how does a player get a negative hitting percentage? Use the formula:

$$HP = \frac{K-E}{TA}$$ where HP = Hitting Percentage or Attack Percentage,

K = Kills, E = Attack Errors, and TA = Total Attack Attempts

___ 7. How tall in inches would a woman be if her BMI = 22.0 and she weighs 118 pounds?

$$BMI = \frac{703W}{H^2}$$ where W = weight in pounds and H = height in inches

___ 8. Babe Ruth holds the career slugging percentage of .690. In 1920, Babe Ruth played his first season for the New York Yankees.   In 458 at bats, Ruth had 172 hits: 73 singles, 36 doubles, 9 triples, and 54 home runs. What was his slugging percentage for that season?
Batter's Slugging Average:

$$SLA = \frac{S + 2 \bullet D + 3 \bullet T + 4 \bullet HR}{AB}$$ where S = Singles, D = Doubles, T = Triples,

HR = Home Runs, and AB = At Bats.

___ 9. If lightning is one mile away from you, how many seconds from the time you see the lightning until the time you hear the thunder?

$$D = 1130 \bullet t$$ where t = the number of seconds from the time you
see lightning flash until you hear the thunder and
D is measured in feet

___ 10. If it takes you 7 hours 15 minutes to drive 500 miles, what was your average rate of speed?

$$D = R \bullet T$$ where T = time and R = Rate

___ 11. From 1966 to 1968, Chrysler made a 440 engine (actual displacement was 439.7 cubic inches). If the bore was 4.32 inches and there were 8 cylinders, what was the length of the stroke?

$$D = \frac{\pi}{4} B^2 SN$$ where D is the displacement of an engine, B = the bore,

S = the stroke, and N = the number of cylinders.

This can be simplified to $D = .7854 B^2 SN$

___ 12. Aquariums come in different sizes, but one standard size is 36"x18"x12". How many gallons of water will the aquarium hold?

$$G = \frac{L \bullet W \bullet H}{231}$$ where G = number of gallons in the aquarium, and

L, W, and H are the dimensions of the aquarium in inches
(231 is the number of cubic inches in a gallon)

___ 13. What size TV should you buy if your TV is 12 feet from the couch?

$$TV = \frac{D}{2.5}$$ where TV = ideal screen size and D = distance in inches

from your couch to your TV stand

___ 14. Determine the total amount of money in your account if you invested $1,000 at 1.1% compounded quarterly for 5 years.

Compound Interest Formula: $A = P\left(1+\dfrac{r}{n}\right)^{nt}$

where A = Total Amount (current worth)

P = initial deposit or Principal

r = annual interest rate (expressed as a decimal: eg. 0.012 for 1.2%)

n = # of times per year interest is compounded

t = number of years invested

___ 15. The highest temperature ever recorded in North America was 56.7 degrees Celsius in Furnace Creek Ranch, Death Valley, California. How hot is that in Fahrenheit degrees?

(A) Celsius to Fahrenheit: $F = \dfrac{9}{5}C + 32$ where C = Celsius and F = Fahrenheit

(B) Fahrenheit to Celsius: $C = \dfrac{5}{9}(F - 32)$ where C = Celsius and F = Fahrenheit

___ 16. Determine the total stopping distance if you are traveling at 65 mph.

(A) Reaction Distance: $RD = 1.1R$ where R = Rate of car in mph

(B) Braking Distance: $BD = .0515R^2$ where R = Rate of car in mph

(C) Total Stopping Distance: $D = 1.1R + .0515R^2$ where R = Rate

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Answers

A. 33.66

B. 144

C. 4.67

D. 66.2

E. 57.6

F. 3.75

G. 68.97

H. 1013.83

I. 1056.46

J. when E − K > 0

K. when E > K

L. .299

M. 5196.312

N. 134

O. 61.4

P. 2.17

Q. 300

R. 289

S. 23.355

T. .847

U. 1.54

V. 1.75

W. .308

X. 27.222

Y. 157,464

Z. None of the above