

Sample Problems

The following problems do not convey the excitement of the fantasy games themselves. The only way to understand how dynamic fantasy sports are in the classroom is to actually play the games. The purpose of these examples is to simply give you an idea of some of the types of concepts that are included in the programs.

Example for Fantasy Football

Using the default scoring system, how many points did Carson Palmer earn during Week 2 of the 2007 NFL season? Express the answer as a decimal rounded to the nearest thousandth.

Answer (Non-algebraic method)

$$6 \text{ TD} = 6/8 \text{ (1/8 for each TD)}$$

$$10 \text{ yards rushing} = 1/48 \text{ (1/48 for each 10 yards rushing)}$$

$$401 \text{ yards passing} = 16/48 \text{ (1/48 for each 25 yards passing)}$$

$$2 \text{ interceptions} = -2/12 \text{ (-1/12 for each interception)}$$

$$6/8 + 1/48 + 16/48 - 2/12 = 45/48 = .938$$

Answer (Algebraic method)

$$\text{Use } 1/8 \text{ (T)} + 1/24 \text{ (V)} + 1/48 \text{ (P + R + C)} - 1/12 \text{ (I)} - 1/16 \text{ (F)} = \text{W}$$

$$1/8(6) + 0 + 1/48 (17) - 1/12 (2) - 1/16 (0) = 45/48 = .938$$

Example for Fantasy Soccer

Using the default scoring system, how many points did David Beckham earn during Week 4 (April 28) of the 2007 MLS season? Express the answer as a decimal rounded to the nearest thousandth.

Answer (Non-algebraic method)

$$1 \text{ goal} = 1/4$$

$$0 \text{ saves} = 0$$

$$2 \text{ assists} = 2/6 \text{ (1/6 for each assist)}$$

$$0 \text{ yellow cards} = 0$$

$$0 \text{ red cards} = 0$$

11 total shots = $11/8$ ($1/8$ for each total shot by player's team)

3 fouls = $-3/24$ ($-1/24$ for each foul)

3 offsides = $-3/24$ ($-1/24$ for each offside by player's team)

$$1/4 + 0 + 2/6 - 0 - 0 + 11/8 - 3/24 - 3/24 = 1 \frac{17}{24} = 1.708$$

Answer (Algebraic method)

$$\text{Use } 1/4 (G) + 1/6 (S + A) - 1/12 (Y + R) + 1/8 (T) - 1/24 (F + O) = W$$

$$1/4 (1) + 1/6 (2) - 1/12 (0) + 1/8 (11) - 1/24 (6) = 1 \frac{17}{24} = 1.708$$

Example for Fantasy Basketball

Using the default scoring system and basic method, how many points did Steve Nash earn against the Lakers on December 25, 2007? Express the answer as a decimal rounded to the nearest hundredth.

Answer (Non-algebraic method)

24 points = $24/36$ ($1/36$ for each point scored)

2 rebounds = $2/9$ ($1/9$ for each rebound)

1 blocked shot = $1/6$

17 steals/assists = $17/12$ ($1/12$ for each steal or assist)

4 turnovers/fouls = $-4/18$ ($-1/18$ for each turnover or foul)

$$24/36 + 2/9 + 1/6 + 17/12 - 4/18 = 81/36 = 2 \frac{9}{36} = 2 \frac{1}{4} = 2.25$$

Answer (Algebraic method)

$$\text{Use } 1/36 (P) + 1/9 (R) + 1/6 (B) + 1/12 (A + S) - 1/18 (T + F)$$

$$1/36 (24) + 1/9 (2) + 1/6 (1) + 1/12 (17) - 1/18 (4) = 2 \frac{9}{36} = 2 \frac{1}{4} = 2.25$$

Example for Fantasy Baseball

Using the default scoring system, how many points did Albert Pujols earn against the Angels on June 10, 2007? Express the answer as a decimal rounded to the nearest thousandth.

Answer (Non-algebraic method)

2 home runs = 1 ($1/2$ for each home run)

2 runs scored = $2/3$ ($1/3$ for each run scored)

5 runs batted in (rbi) = $5/3$ ($1/3$ for each rbi)

2 hits = $2/6$ ($1/6$ for each hit)

0 stolen bases = 0

1 base on balls = $1/7$

1 strikeout = $-1/21$

0 errors = 0

$$1 + 2/3 + 5/3 + 2/6 + 0 + 1/7 - 1/21 = 158/42 = 3 \frac{32}{42} = 3.762$$

Answer (Algebraic method)

$$\text{Use } 1/2 (H) + 1/3 (R + I) + 1/6 (B) - 1/7 (S + W) - 1/21 (K + E) = T$$

$$1/2 (2) + 1/3 (7) + 1/6 (2) - 1/7 (1) - 1/21 (1) = 158/42 = 3 \frac{32}{42} = 3.762$$

Additional Concepts

1. Interest

If a player signed a six-year contract for \$90,000,000 and invested 15% of his annual salary at a rate of 6.5%, how much interest will he earn at the end of the first year if the interest is compounded annually? (Assume that his income remains constant during the life of his contract).

Use $I = PRT$

I = interest earned

P = principle

R = interest rate

T = time

Answer

$$\$90,000,000/6 = \$15,000,000 \text{ annual salary}$$

$$.15 * \$15,000,000 = \$2,250,000 \text{ invested}$$

$$I = .065 * 2,250,000 * 1$$

$$I = \$146,250$$

2. Probability

The letters “Alfonso Soriano” are placed into a hat. Find the probability of the following random events.

- Selecting the letter o
- Selecting the letters a, r, or s
- Selecting any letter except o
- Selecting the letter f, replacing it, then selecting the letter f again

Answers

- 4/14
- 5/14
- 10/14
- 1/196

3. Finding a Percentage of a Number

Carl Crawford earned 1 and 3/8 points while Jim Thome earned 7/24 points. What percentage of Thome's points do Crawford's points represent?

Answer

$$\text{---}\% \times \frac{7}{24} = 1\frac{3}{8}$$

$$\frac{11}{8} \div \frac{7}{24} = \frac{11}{8} \times \frac{24}{7}$$

$$\frac{11}{8} \times \frac{24}{7} = \frac{33}{7} = 4.71 = 471\%$$

4. Percentage of Price Increase and Decrease

If the price of a ticket increased from \$25 to \$30, what is the percentage of price increase?

$$\text{Answer } \frac{5}{25} = .20 = 20\%$$

5. Ratio and Proportion

The ratio of Ryan Howard's points to Juan Pierre's points is 3:1. If Pierre earned 4/7 points, how many points did Howard earn?

Answer

$$\frac{3}{1} = \frac{n}{\frac{4}{7}}$$

$$n = \frac{12}{7} = 1\frac{5}{7}$$

6. Adding and Subtracting Fractions (two problems)

A) Using the default scoring system, how many more points were earned by Carlos Beltran (NY Mets) than Matt Holliday (Colorado Rockies) from their games on April 4, 2007?

Answer

Points earned by Carlos Beltran

$$\frac{1}{2}(2) + \frac{1}{3}(2+4) + \frac{1}{6}(2) + \frac{1}{7}(0+0) + \frac{1}{21}(1+0) = 3\frac{2}{7}$$

Points earned by Matt Holliday

$$\frac{1}{2}(1) + \frac{1}{3}(2+4) + \frac{1}{6}(4) + \frac{1}{7}(0+0) + \frac{1}{21}(0+0) = 3\frac{1}{6}$$

$$3\frac{2}{7} - 3\frac{1}{6} = \frac{5}{42}$$

B) How many more points did Eli Manning earn compared to Ben Roethlisberger for Week 1 of the 2007 NFL season if Manning had 312 yards passing, 4 touchdowns, and 1 interception, while Roethlisberger had 161 yards passing and 1 touchdown? Use the default scoring system.

Answer

Roethlisberger:

$$4 \text{ TD's} = \frac{4}{8}$$

$$161 \text{ passing yds.} = \frac{6}{48}$$

$$\frac{4}{8} + \frac{6}{48} = \frac{30}{48}$$

Eli Manning:

$$4 \text{ TD's} = \frac{4}{8}$$

$$312 \text{ passing yds.} = \frac{12}{48}$$

$$1 \text{ int.} = -1/12$$

$$4/8 + 12/48 - 1/12 = 32/48$$

$$32/48 \text{ (Manning)} - 30/48 \text{ (Roethlisberger)} = 2/48 = 1/24$$

7. Rounding Decimals

Express Holliday's points earned in the problem above as a decimal rounded to the nearest tenth, hundredth, and thousandth.

Answer

$$3\frac{1}{6} = 3.\overline{16}$$

$$3.\overline{16} \text{ rounded to the nearest } 10^{\text{th}}, 100^{\text{th}}, \& 1000^{\text{th}} = 3.2 \quad 3.17 \quad 3.167$$

8. Proportions

If A-Rod hit four home runs in his first 10 games, how many home runs is he projected to hit in his first 40 games?

Answer

$$\frac{4}{10} = \frac{n}{40}$$

$$10n = 160$$

$$n = 16$$

9. Mean

Find the average player value for the players below:

LaDainian Tomlinson \$12,050,000

Peyton Manning \$9,605,000

Steve Smith \$7,875,000

Antonio Gates \$6,915,000

Answer \$36,445,000 / 4 = \$9,111,250

10. Multiplying Decimals

If Tom Brady earned 1.208 points using a scoring system that is based on a common denominator of 24, how many points did he earn expressed as a fraction?

Answer $.208 \times 24 = 5$, so Brady earned $1 \frac{5}{24}$

11. Measurement

Joseph Addai gained 131 yards rushing. How many feet did he gain? How many inches? How many centimeters?

Answer

$$131 \times 3 = 393 \text{ feet}$$

$$393 \times 12 = 4,716 \text{ inches}$$

$$4,716 \times 2.54 = 11,978.64 \text{ cm. (2.54 cm. = 1 in.)}$$

12. Division with Whole Numbers

If the New England Patriots spent 7,200 minutes practicing in training camp, how many hours did they spend practicing?

Answer $7,200 / 60 = 120$ hours

13. Permutations and Combinations

If Coach Mike Shanahan started two of his five running backs, how many combinations could he choose from?

Answer $5! / 2!(5-2)! = 10$

14. Linear Equations

Solve for the variable below.

$$5^4(2) + 5^3(7) + 5^2(k) - 5^1(2) - 5^0(5 + 2) = 2208$$

$$1250 + 875 + 25k - 10 - 7 = 2208$$

$$25k + 2108 = 2208$$

$$25k = 100$$

$$k = 4$$

15. Diameter

Find the diameter of an on-deck circle on a baseball field if the area of the circle is 7.065 ft.^2

Answer

$$A = \pi r^2$$

$$7.065 = 3.14 r^2$$

$$2.25 = r^2$$

$$r = 1.5$$

16. The Pythagorean Theorem

The distance between consecutive bases on a baseball diamond is 60 feet. Find the distance from home plate to second base.

Answer

$$a^2 + b^2 = c^2$$

$$60^2 + 60^2 = c^2$$

$$7200 = c^2$$

$$c = 84.9 \text{ feet}$$

17. Functions

Write the function rule and solve for the variable.

x = bases on balls; y = strikeouts

x	y
4	3
12	9
36	27
108	n

Answer

$$n = 81$$

Function rule $.75x = y$

18. Area and Perimeter of Rectangles

Find the area and perimeter of a ballpark in the following units if the length is 1,300 feet and the width is 850 feet.

Answer

Area in square feet $1,300 * 850 = 1,105,000$ sq. ft.

Area in square inches $1,105,000 * 144$ (# of sq. in. in 1 sq. ft.) = 159,120,000 sq. in.

Area in square yards $1,105,000 / 9$ (# of sq. ft. in 1 sq. yd.) = 122,777.78 sq. yds.

Area in square centimeters $159,120,000 * 6.45$ (# of sq. cm. in 1 sq. in.) = 1,026,324,000 sq.cm.

19. Extra Credit

Students create their own scoring systems for any fantasy sport, and compute their points based on those scoring systems. The entire class could compute points based on a scoring system that was developed by a student.

20. Graphing

Students create circle graphs, bar graphs, and line graphs based on the scoring breakdown of their teams each week. Click on “Examples of Graphs” on the main menu to view examples.