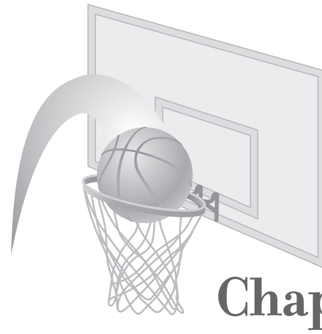
Part One

Computing Weekly Points



Chapter One

How to Play Fantasy Basketball and Mathematics

Fantasy Basketball and Mathematics is a game in which participants select and manage their own teams of players from men's or women's professional or college basketball teams. Participants can even select players who play on high school teams, if those players' statistics are available. The basketball players earn points for rebounds, assists, steals, blocked shots, and points scored. Players lose points for personal fouls and turnovers. Each week, students find the sum of the points earned by their players, using one of the scoring systems in this book. The object of the game is to accumulate the highest number of points.

How to Play the Game

Step 1: Selecting players
Step 2: Reading box scores
Step 3: Collecting data
Step 4: Computing points

Step 1: Selecting Players

There are two options for selecting players. Option 1 includes a salary cap and player values. Player values and salary caps will be updated before each season and posted at www.fantasysportsmath.com. The process of creating new player values is time-consuming and requires research and extensive knowledge of the players' performance over the last several years. Additional factors taken into account when assigning player values include current injuries, whether a player recently changed teams, team chemistry, and so on. The purchase of this book entitles you to one season of free player values. Lists of player values for subsequent seasons will be provided for a nominal fee. To access player values, visit www.fantasysportsmath.com. Click on "Player Values." Type in your password, which is w4f4p7p7. This password can be used one time only, after which it will expire.

In option 2, you avoid the salary cap and player values, but students do not receive several benefits of these critical components of the game, which are explained later.

Option 1: Permanent Teams with Salary Cap

Students have a salary cap of $25 million. This is the amount they can spend on player values. Students select eight professional players. It is not possible to select college or high school players with this option because player values are not readily accessible for college and high school players. In addition, the Women's National Basketball Association season runs from June to September, which means that professional female players can be selected only by students who are in summer school. More than one student can select the same player.

Table 1.1 lists the number of players to be selected at each position as well as the number of players in a starting lineup for each position.

The main advantage of using option 1 is that it promotes equality in the game. If students spend close to the salary cap on their players' salaries, the quality of their teams should be relatively equal. In my classroom, I always used a salary cap and player values, and many of my students (both girls and boys) who knew very little about basketball managed to do very well and, in several instances, win the game.

Table 1.1. Basketball Positions: Number to Be Selected and Number in a Starting Lineup

Position	Number to Be Selected	Number in a Starting Lineup
Center	2	1
Forward	3	2
Guard	3	2

Another advantage of option 1 is that students have to compromise as they select players because the salary cap is structured so that they cannot simply select the top players at each position. This allows them to hone their decision-making skills, which facilitates their cognitive development. Students can also make trades. (Trades are described later in this chapter.)

Another benefit of using option 1 is that students get to work with large numbers as they attempt to spend as close as possible to the salary cap. Moreover, in addition to circle graphs, students will be able to construct stacked-bar and multiple-line graphs to track player performance over time because they will use the same players for the duration of the game.

Finally, in option 1, if a player is determined to be out for the year, students can use the portion of the salary cap they spent on that player to purchase another player.

For all of the preceding reasons, option 1 is recommended.

Option 2: Different Teams Each Week

In option 2, each student selects one team each week. For example, if a student lives in Boston, she may decide to select her hometown professional team for the first week of the game. Perhaps she will choose college and high school teams from the Boston area for the second and third weeks, respectively. However, she will not be allowed to choose those teams in later weeks because each team can be selected only once by each student during the game. This not does preclude other students from selecting those same teams, as long as each student selects a particular team only once during the course of the game. Unlike in option 1, students compute points using team statistics rather than individual statistics. For example, if a team gets a total of 37 rebounds, that number would be used to compute points.

If you use option 1 to select players, students' rosters will remain the same for the length of the game, unless there are trades. If you use option 2, students' players will change from week to week. *Note that the handouts, graphs, and worksheets in this text are all based on option 1.*

Choosing Your Own Team

In addition to having students choose players, you should also create your own fantasy team. You can use your team as an example and to help assess students' work. Students also enjoy competing with their teachers or parents!

Trades

Students may trade players if they selected players using option 1. Trades do not have to be position for position; for example, a student might trade a center for a guard. Salary cap numbers do not apply to trades.

Based on my experience, I suggest that you may want to limit the number of trades to five or ten per student because some students may make so many trades that they will not be able to remember who is on their team! When a trade is consummated, it is important that the students involved in the trade make the necessary alterations to their fantasy team roster.

Injuries

If you cannot locate a player's name in the box scores, he or she is probably injured. *If this occurs, the players' score is counted as zero.* If a player is declared out for the remainder of the season and if students used option 1 to select players, the money that was spent for that player can be used to purchase another player who plays the same position. A list of injured players can be found in newspapers as well as online at www.fantasysportsmath.com or on other sports Web sites.

Step 2: Reading Box Scores

Box scores are written in several formats, but they all convey the same basic information. A fabricated box score is shown in Table 1.2. The statistics you will use are highlighted in bold and include rebounds, assists, steals, turnovers, blocked shots, personal fouls, and points scored.

Table 1.2. Sample Box Score: Buzz at Hammer

Player	FG-A	FT-A	3P-A	Off	**Reb**	**Ast**	**St**	**TO**	**Blk**	**PF**	**Pts**
Buzz											
R. Yamamoto	1–5	0–0	1–4	2	4	2	1	0	0	2	5
B. Chow	6–9	4–4	0–0	1	10	3	0	4	3	3	16
N. Ozols	2–3	1–2	0–0	1	1	1	1	0	0	4	5
N. Williams	3–8	0–0	0–0	1	4	3	1	2	0	0	6
M. Johnson	4–8	4–6	1–3	0	1	1	2	2	0	2	15
O. Pommey	5–9	0–0	3–7	1	3	1	0	1	0	1	19
D. Jankowski	1–3	0–0	1–1	0	0	1	1	0	0	0	5
M. Brown	3–4	0–0	0–0	0	0	3	0	1	0	1	6
T. Markovic	0–5	0–0	2–5	0	0	0	0	0	0	1	6

(*Cont'd.*)

Table 1.2. Sample Box Score: Buzz at Hammer (*Cont'd.*)

Player	FG-A	FT-A	3P-A	Off	**Reb**	**Ast**	**St**	**TO**	**Blk**	**PF**	**Pts**
Hammer											
U. Gomez	2–4	5–6	0–0	2	5	1	1	2	0	1	9
J. Miller	0–2	2–2	0–2	1	3	0	0	0	0	1	2
H. Jackson	5–8	7–11	0–0	1	8	0	1	4	1	4	17
J. Sokolov	1–4	0–0	0–0	0	2	4	0	1	1	0	2
L. Novak	4–10	4–5	2–2	0	3	4	1	3	0	2	18
A. Smith	4–4	3–6	0–0	0	0	0	1	2	3	2	11
J. Takahashi	2–5	1–2	1–2	1	6	1	0	0	0	2	8
G. Harris	1–2	0–0	0–0	1	1	5	1	3	1	2	2
V. Walker	9–14	0–0	2–5	1	2	1	5	4	0	3	24

Note: FG-A = field goals made and attempted; FT-A = free throws made and attempted; 3P-A = three-point shots made and attempted; Off = offensive rebounds; **Reb = rebounds; Ast = assists; St = steals; TO = turnovers; Blk = blocked shots; PF = personal fouls; Pts = points scored.** Items in bold will be used in the Fantasy Basketball and Math game.

Step 3: Collecting Data

Each week, students use newspapers or online resources to access data from one game for each of the players in their starting lineup. Students can choose the game that produced the best statistics for each player. Options for collecting data include the following:

1. Enroll your class in a newspapers-in-education program in order to receive free copies of newspapers.
2. Choose a couple of students to cut box scores out of a newspaper and make copies for the other students. Students can reference the basketball standings in the newspaper to ensure that they have cut out at least one box score for each team. This duty can be rotated.
3. Have students visit www.fantasysportsmath.com and do the following:
   a. Click the "Get Basketball Stats" link.
   b. On the following page, use the calendar to select any day from the previous week.

c. Find a game one of your players participated in and click on the box score for that game. Students can find the game during the previous week in which each of their players produced the best statistics.

Using online resources is the quickest and easiest method. Statistics are also archived online so that students can access data if they have missed a week or two.

Step 4: Computing Points

The default scoring system is one of over 100 scoring systems in this book. (For additional scoring systems, see the end of this chapter.) Scoring systems give students opportunities to work with roots, exponents, summations, factorials, integers, fractions, decimals, and absolute value. Teachers can choose the scoring systems that best fit the skill level of their students. Table 1.3 shows the default scoring system. Each week, students use the statistics from one game for each of their players in order to compute points for their team.

Students may use either the advanced method or the basic method to compute points earned. The basic method awards points for *each* point scored, each rebound, each assist, and so on, whereas the advanced method awards points for *sets of three* or *sets of five* points scored, rebounds, and so on.

Each method has pros and cons. The basic method is easier and more user-friendly for students, but students who use the advanced method will be able

Table 1.3. Default Scoring System

Advanced Method	Basic Method	
For every	For every	Players earn
5 points	Point	$\frac{1}{36}$
5 rebounds	Rebound	$\frac{1}{9}$
3 blocked shots	Blocked shot	$\frac{1}{6}$
3 assists or steals*	Assist or steal	$\frac{1}{12}$
5 turnovers or fouls**	Turnover or foul	$-\frac{1}{18}$

*Any combination of assists or steals totaling three
**Any combination of turnovers or fouls totaling five

to more precisely plot numerical values on their graphs because teams earn fewer points compared to the basic method.

I used the advanced method in my classes because I wanted my students to be able to plot numerical values as precisely as possible. For example, the stacked-bar graph in Chapter Three (Handout 12) uses intervals of $\frac{1}{36}$. That said, some teachers may like the idea of students estimating points on the *y*-axis of their graphs, and the basic method also results in much higher cumulative point totals, giving students more opportunities to work with improper fractions.

Note that all graphs in this book are based on the advanced method.

It is possible (though unlikely) that a basketball player may earn a negative amount of points, even if students are using scoring systems that are based on positive numerical values. In other words, a player may have a bad game statistically and not generate enough positive points to offset the negative points earned by his or her turnovers or fouls. You can prevent this scenario by informing students that the lowest score for a player for one week will be zero, thus ensuring that younger students will not be confused by negative numerical values.

Table 1.4 lists the Huskies, a sample team that is used throughout this book. All players on the Huskies are from the box score in Table 1.2. Normally all players on a team will not be found in the same box score because students usually select players from several teams.

Let's use the advanced method to compute points earned by Hal Jackson, who scored 17 points. Players earn $\frac{1}{36}$ for each set of 5 points scored. Points are not prorated above multiples of five, so we round Jackson's 17 points down to the nearest multiple of five, which is 15. Since there are three fives in 15 and players earn $\frac{1}{36}$ for each set of five points, Jackson earned $\frac{3}{36}$. This same process is repeated with rebounds as well as turnovers/personal fouls. With respect to assists/steals and blocked shots, points are earned for each set of three, so we round down to the nearest multiple of three before dividing by three.

The points earned by individual players can be computed via two different approaches: one uses variables in linear equations, and the other method does not. If students use both approaches to compute points, they can verify their

Table 1.4. The Huskies

Player	Position	Team
Nate Williams	Guard	Buzz
Tomas Markovic	Guard	Buzz
Lukas Novak	Forward	Hammer
Bobby Chow	Forward	Buzz
Hal Jackson	Center	Hammer

Table 1.5. Computation of Weekly Points for the Huskies (Advanced Method)

Hal Jackson		
Points scored:	17 points = 3 sets of 5	$3 \times \frac{1}{36} = \frac{3}{36}$
Rebounds:	8 rebounds = 1 set of 5	$1 \times \frac{1}{9} = \frac{1}{9}$
Blocked shots:	1 blocked shot = 0 sets of 3	$0 \times \frac{1}{6} = 0$
Assists + steals:	1 steal = 0 sets of 3	$0 \times \frac{1}{12} = 0$
Turnovers + fouls:	8 turnovers/fouls = 1 set of 5	$1 \times \left(-\frac{1}{18}\right) = -\frac{1}{18}$
Total points for Jackson:		$\frac{5}{36}$
Lukas Novak		
Points scored:	18 points = 3 sets of 5	$3 \times \frac{1}{36} = \frac{3}{36}$
Rebounds:	3 rebounds = 0 sets of 5	$0 \times \frac{1}{9} = 0$
Blocked shots:	0 blocked shots = 0 sets of 3	$0 \times \frac{1}{6} = 0$
Assists + steals:	5 assists/steals = 1 set of 3	$1 \times \frac{1}{12} = \frac{1}{12}$
Turnovers + fouls:	5 turnovers/fouls = 1 set of 5	$1 \times \left(-\frac{1}{18}\right) = -\frac{1}{18}$
Total points for Novak:		$\frac{4}{36}$
Nate Williams		
Points scored:	6 points = 1 set of 5	$1 \times \frac{1}{36} = \frac{1}{36}$
Rebounds:	4 rebounds = 0 sets of 5	$0 \times \frac{1}{9} = 0$
Blocked shots:	0 blocked shots = 0 sets of 3	$0 \times \frac{1}{6} = 0$
Assists + steals:	4 assists/steal = 1 set of 3	$1 \times \frac{1}{12} = \frac{1}{12}$
Turnovers + fouls:	2 turnovers/fouls = 0 sets of 5	$0 \times \left(-\frac{1}{18}\right) = 0$
Total points for Williams:		$\frac{4}{36}$

(*Cont'd.*)

Table 1.5. Computation of Weekly Points for the Huskies (Advanced Method) (*Cont'd.*)

Bobby Chow		
Points scored:	16 points = 3 sets of 5	$3 \times \frac{1}{36} = \frac{3}{36}$
Rebounds:	10 rebounds = 2 sets of 5	$2 \times \frac{1}{9} = \frac{2}{9}$
Blocked shots:	3 blocked shots = 1 set of 3	$1 \times \frac{1}{6} = \frac{1}{6}$
Assists + steals:	3 assists/steals = 1 set of 3	$1 \times \frac{1}{12} = \frac{1}{12}$
Turnovers + fouls:	7 turnovers/fouls = 1 set of 5	$1 \times \left(-\frac{1}{18}\right) = -\frac{1}{18}$
Total points for Chow:		$\frac{18}{36}$
Tomas Markovic		
Points scored:	6 points = 1 set of 5	$1 \times \frac{1}{36} = \frac{1}{36}$
Rebounds:	0 rebounds = 0 sets of 5	$0 \times \frac{1}{9} = 0$
Blocked shots:	0 blocked shots = 0 sets of 3	$0 \times \frac{1}{6} = 0$
Assists + steals:	0 assists/steals = 0 sets of 3	$0 \times \frac{1}{12} = 0$
Turnovers + fouls:	1 turnover/foul = 0 sets of 5	$0 \times \left(-\frac{1}{18}\right) = 0$
Total points for Markovic:		$\frac{1}{36}$
Total points for the Huskies:		$\frac{32}{36} = \frac{8}{9}$

results. However, if students do not yet have the skills to work with variables in linear equations, they can compute points using the non-algebraic technique.

Table 1.5 shows how to use the advanced method to compute the points earned by the Huskies.

Table 1.6 shows how to use the basic method to compute the points earned by the Huskies.

Handout 6 will help guide students as they practice using the advanced or basic approach.

Table 1.6. Computation of Weekly Points for the Huskies (Basic Method)

Hal Jackson		
Points scored:	17 points	$17 \times \frac{1}{36} = \frac{17}{36}$
Rebounds:	8 rebounds	$8 \times \frac{1}{9} = \frac{8}{9}$
Blocked shots:	1 blocked shot	$1 \times \frac{1}{6} = \frac{1}{6}$
Assists + steals:	1 steal	$1 \times \frac{1}{12} = \frac{1}{12}$
Turnovers + fouls:	8 turnovers/fouls	$8 \times \left(-\frac{1}{18}\right) = -\frac{8}{18}$
Total points for Jackson:		$\frac{42}{36}$
Lukas Novak		
Points scored:	18 points	$18 \times \frac{1}{36} = \frac{18}{36}$
Rebounds:	3 rebounds	$3 \times \frac{1}{9} = \frac{3}{9}$
Blocked shots:	0 blocked shots	$0 \times \frac{1}{6} = 0$
Assists + steals:	5 assists/steals	$5 \times \frac{1}{12} = \frac{5}{12}$
Turnovers + fouls:	5 turnovers/fouls	$5 \times \left(-\frac{1}{18}\right) = -\frac{5}{18}$
Total points for Novak:		$\frac{35}{36}$
Nate Williams		
Points scored:	6 points	$6 \times \frac{1}{36} = \frac{6}{36}$
Rebounds:	4 rebounds	$4 \times \frac{1}{9} = \frac{4}{9}$
Blocked shots:	0 blocked shots	$0 \times \frac{1}{6} = 0$
Assists + steals:	4 assists/steals	$4 \times \frac{1}{12} = \frac{4}{12}$
Turnovers + fouls:	2 turnovers/fouls	$2 \times \left(-\frac{1}{18}\right) = -\frac{2}{18}$
Total points for Williams:		$\frac{30}{36}$

(*Cont'd.*)

Table 1.6. Computation of Weekly Points for the Huskies (Basic Method) (*Cont'd.*)

Bobby Chow		
Points scored:	16 points	$16 \times \frac{1}{36} = \frac{16}{36}$
Rebounds:	10 rebounds	$10 \times \frac{1}{9} = \frac{10}{9}$
Blocked shots:	3 blocked shots	$3 \times \frac{1}{6} = \frac{3}{6}$
Assists + steals:	3 assists/steals	$3 \times \frac{1}{12} = \frac{3}{12}$
Turnovers + fouls:	7 turnovers/fouls	$7 \times \left(-\frac{1}{18}\right) = -\frac{7}{18}$
Total points for Chow:		$\frac{69}{36}$
Tomas Markovic		
Points scored:	6 points	$6 \times \frac{1}{36} = \frac{6}{36}$
Rebounds:	0 rebounds	$0 \times \frac{1}{9} = 0$
Blocked shots:	0 blocked shots	$0 \times \frac{1}{6} = 0$
Assists + steals:	0 assists/steals	$0 \times \frac{1}{12} = 0$
Turnovers + fouls:	1 turnover/foul	$1 \times \frac{1}{18} = -\frac{1}{18}$
Total points for Markovic:		$\frac{4}{36}$
Total points for the Huskies:		$\frac{180}{36} = 5$

As you can see, neither the advanced method nor the basic method use algebra. After using the non-algebraic method for a few weeks, you can introduce the algebraic method, which uses linear equations that contain variables. These equations are called *total points equations.* The default total points equation uses the same numerical values as the default scoring system. (In fact, each total points equation represents a scoring system.) The transition to linear equations is easier for students because they are used to working with the data, only in a different format. Once they use the equation (or equations) a few times, they become comfortable and are proud that they are doing algebra. The default total points equation is displayed in the next section.

Default Total Points Equation

Numerical values are the same as in the default scoring system.

$$\frac{1}{36}(P) + \frac{1}{9}(R) + \frac{1}{6}(B) + \frac{1}{12}(A + S) - \frac{1}{18}(T + F) = W$$

Advanced Method

P = number of points scored by one player, rounded down to the nearest multiple of 5, divided by 5
R = number of rebounds by one player, rounded down to the nearest multiple of 5, divided by 5
B = number of blocked shots by one player, rounded down to the nearest multiple of 3, divided by 3
$A + S$ = number of assists and steals by one player, rounded down to the nearest multiple of 3, divided by 3
$T + F$ = number of turnovers and fouls by one player, rounded down to the nearest multiple of 5, divided by 5

Basic Method

P = number of points scored by one player
R = number of rebounds by one player
B = number of blocked shots by one player
$A + S$ = number of assists and steals by one player
$T + F$ = number of turnovers and fouls by one player

Default Total Points Equation (Advanced Method)

Jackson

$$\frac{1}{36}(3) + \frac{1}{9}(1) + \frac{1}{6}(0) + \frac{1}{12}(0) - \frac{1}{18}(1) = \frac{5}{36}$$

Novak

$$\frac{1}{36}(3) + \frac{1}{9}(0) + \frac{1}{6}(0) + \frac{1}{12}(1) - \frac{1}{18}(1) = \frac{4}{36}$$

Williams

$$\frac{1}{36}(1) + \frac{1}{9}(0) + \frac{1}{6}(0) + \frac{1}{12}(1) - \frac{1}{18}(0) = \frac{4}{36}$$

Chow

$$\frac{1}{36}(3) + \frac{1}{9}(2) + \frac{1}{6}(1) + \frac{1}{12}(1) - \frac{1}{18}(1) = \frac{18}{36}$$

Markovic

$$\frac{1}{36}(1) + \frac{1}{9}(0) + \frac{1}{6}(0) + \frac{1}{12}(0) - \frac{1}{18}(0) = \frac{1}{36}$$

Total points earned: $\frac{32}{36} = \frac{8}{9}$

Default Total Points Equation (Basic Method)

$$\frac{1}{36}(P) + \frac{1}{9}(R) + \frac{1}{6}(B) + \frac{1}{12}(A + S) - \frac{1}{18}(T + F) = W$$

Jackson

$$\frac{1}{36}(17) + \frac{1}{9}(8) + \frac{1}{6}(1) + \frac{1}{12}(1) - \frac{1}{18}(8) = 1\frac{1}{6}$$

Novak

$$\frac{1}{36}(18) + \frac{1}{9}(3) + \frac{1}{6}(0) + \frac{1}{12}(5) - \frac{1}{18}(5) = \frac{35}{36}$$

Williams

$$\frac{1}{36}(6) + \frac{1}{9}(4) + \frac{1}{6}(0) + \frac{1}{12}(4) - \frac{1}{18}(2) = \frac{5}{6}$$

Chow

$$\frac{1}{36}(16) + \frac{1}{9}(10) + \frac{1}{6}(3) + \frac{1}{12}(3) - \frac{1}{18}(7) = 1\frac{11}{12}$$

Markovic

$$\frac{1}{36}(6) + \frac{1}{9}(0) + \frac{1}{6}(0) + \frac{1}{12}(0) - \frac{1}{18}(1) = \frac{1}{9}$$

Total points for the Huskies for week 1: $\frac{180}{36} = 5$

Additional Scoring Systems

The following pages contain 138 scoring systems. If students are not prepared to use variables in linear equations, you can still use any scoring system by simply using the values from any total points equation. For example, let's say that for a few weeks, you used the default scoring system, which is based on a common denominator of 36. If you wanted students to practice with a different common denominator (or practice with decimals, exponents, roots, or another concept), you could use numerical values from a different equation. Thus, you have the option of choosing scoring systems that match the skill level of your students. In my classes, I used one scoring system throughout the game and supplemented that system with additional scoring systems when students were ready. Students should use one specific scoring system throughout the game to determine their cumulative points and to update their stacked-bar and multiple-line graphs. Additional scoring systems can be introduced when students are ready to learn new skills.

The scoring systems that follow are categorized according to their content and whether or not they use relative proportionality. For example, scoring systems number three and thirteen (located below) use relative proportionality because the ratios between the fractions in each scoring system are the same. In other words, a point scored by a player is always worth one-fourth as much as a rebound, one-sixth as much as a blocked shot, one-third as much as an assist or steal, and one-half as much as a turnover or personal foul.

$$3.\quad \frac{1}{48}(P) + \frac{1}{12}(R) + \frac{1}{8}(B) + \frac{1}{16}(A + S) - \frac{1}{24}(T + F) = W$$

$$13.\quad \frac{1}{24}(P) + \frac{1}{6}(R) + \frac{1}{4}(B) + \frac{1}{8}(A + S) - \frac{1}{12}(T + F) = W$$

The advantage of using scoring systems that use relative proportionality is that you can use these different scoring systems during the course of the game without unfairly changing the rankings. In other words, a student whose team earned the highest number of points in a given week will earn the highest number of points in that week no matter which scoring systems are used, so long as the scoring systems are proportionate. Conversely, let's say you used a scoring system that was based on fractions for the first ten weeks, then used a different scoring system for week 11 that was based on factorials and not proportionate to the original scoring system you used. It is possible that the student who was in last place after ten weeks could leap into first place after week 11 if her team performed strongly, because the scoring systems based on factorials are not proportionate and can result in teams earning hundreds of points in one week. Consequently, it's not fair for a student who has built up a small lead over the course of ten weeks to suddenly be hundreds of points out of the lead based on one week. For this reason, I suggest using the same scoring system or scoring systems that are proportionate throughout the game, in order to determine standings. If you wish to include other scoring systems, I would not include these to determine the rankings of the students' teams.

Scoring systems 1–34 and 41–70 use relative proportionality, while scoring systems 71–96 use a different relative proportionality.

Many scoring systems (that is, total points equations) are more advanced than the default scoring system, especially those that are based on negative numerical values. In those systems, the goal is to acquire the least amount of points (or the greatest absolute value). Acquiring the least amount of points is an effective way to teach the concept of absolute value. In the following example, a player might earn $\frac{37}{48}$ if a student used scoring system number three. However, if the student placed absolute value symbols around scoring system number four before using it to compute points, the player would also earn $\frac{37}{48}$.

$$3.\quad \frac{1}{48}(3) + \frac{1}{12}(2) + \frac{1}{8}(3) + \frac{1}{16}(2 + 2) - \frac{1}{24}(1 + 1) = \frac{37}{48}$$

$$4.\quad \left|-\frac{1}{48}(3) - \frac{1}{12}(2) - \frac{1}{8}(3) - \frac{1}{16}(2 + 2) + \frac{1}{24}(1 + 1)\right| = \frac{37}{48}$$

Consequently, students can check their work by using both positive and negative versions of the same scoring system, since both will result in the same absolute value. In order to do this, you can simply insert absolute value symbols around any scoring system that is based on negative numerical values.

Additional Scoring Systems (Total Points Equations)

Integers

1. $1\,(P) + 4\,(R) + 6\,(B) + 3\,(A + S) - 2\,(T + F) = W$
2. $-1\,(P) - 4\,(R) - 6\,(B) - 3\,(A + S) + 2\,(T + F) = W$

Fractions

3. $\frac{1}{48}(P) + \frac{1}{12}(R) + \frac{1}{8}(B) + \frac{1}{16}(A + S) - \frac{1}{24}(T + F) = W$
4. $-\frac{1}{48}(P) - \frac{1}{12}(R) - \frac{1}{8}(B) - \frac{1}{16}(A + S) + \frac{1}{24}(T + F) = W$
5. $\frac{1}{36}(P) + \frac{1}{9}(R) + \frac{1}{6}(B) + \frac{1}{12}(A + S) - \frac{1}{18}(T + F) = W$
6. $-\frac{1}{36}(P) - \frac{1}{9}(R) - \frac{1}{6}(B) - \frac{1}{12}(A + S) + \frac{1}{18}(T + F) = W$
7. $\frac{1}{54}(P) + \frac{1}{13.5}(R) + \frac{1}{9}(B) + \frac{1}{18}(A + S) - \frac{1}{27}(T + F) = W$
8. $-\frac{1}{54}(P) - \frac{1}{13.5}(R) - \frac{1}{9}(B) - \frac{1}{18}(A + S) + \frac{1}{27}(T + F) = W$
9. $\frac{1}{60}(P) + \frac{1}{15}(R) + \frac{1}{10}(B) + \frac{1}{20}(A + S) - \frac{1}{30}(T + F) = W$
10. $-\frac{1}{60}(P) - \frac{1}{15}(R) - \frac{1}{10}(B) - \frac{1}{20}(A + S) + \frac{1}{30}(T + F) = W$
11. $\frac{1}{72}(P) + \frac{1}{18}(R) + \frac{1}{12}(B) + \frac{1}{24}(A + S) - \frac{1}{36}(T + F) = W$
12. $-\frac{1}{72}(P) - \frac{1}{18}(R) - \frac{1}{12}(B) - \frac{1}{24}(A + S) + \frac{1}{36}(T + F) = W$
13. $\frac{1}{24}(P) + \frac{1}{6}(R) + \frac{1}{4}(B) + \frac{1}{8}(A + S) - \frac{1}{12}(T + F) = W$
14. $-\frac{1}{24}(P) - \frac{1}{6}(R) - \frac{1}{4}(B) - \frac{1}{8}(A + S) + \frac{1}{12}(T + F) = W$
15. $\frac{1}{12}(P) + \frac{1}{3}(R) + \frac{1}{2}(B) + \frac{1}{4}(A + S) - \frac{1}{6}(T + F) = W$
16. $-\frac{1}{12}(P) - \frac{1}{3}(R) - \frac{1}{2}(B) - \frac{1}{4}(A + S) + \frac{1}{6}(T + F) = W$

17. $\frac{1}{84}(P) + \frac{1}{21}(R) + \frac{1}{14}(B) + \frac{1}{28}(A + S) - \frac{1}{42}(T + F) = W$

18. $-\frac{1}{84}(P) - \frac{1}{21}(R) - \frac{1}{14}(B) - \frac{1}{28}(A + S) + \frac{1}{42}(T + F) = W$

19. $\frac{1}{96}(P) + \frac{1}{24}(R) + \frac{1}{16}(B) + \frac{1}{32}(A + S) - \frac{1}{48}(T + F) = W$

20. $-\frac{1}{96}(P) - \frac{1}{24}(R) - \frac{1}{16}(B) - \frac{1}{32}(A + S) + \frac{1}{48}(T + F) = W$

21. $\frac{1}{108}(P) + \frac{1}{27}(R) + \frac{1}{18}(B) + \frac{1}{36}(A + S) - \frac{1}{54}(T + F) = W$

22. $-\frac{1}{108}(P) - \frac{1}{27}(R) - \frac{1}{18}(B) - \frac{1}{36}(A + S) + \frac{1}{54}(T + F) = W$

23. $\frac{1}{10}(P) + \frac{1}{2.5}(R) + \frac{1}{1.\overline{6}}(B) + \frac{1}{3.\overline{3}}(A + S) - \frac{1}{5}(T + F) = W$

24. $-\frac{1}{10}(P) - \frac{1}{2.5}(R) - \frac{1}{1.\overline{6}}(B) - \frac{1}{3.\overline{3}}(A + S) + \frac{1}{5}(T + F) = W$

25. $\frac{1}{500}(P) + \frac{1}{125}(R) + \frac{1}{83.\overline{3}}(B) + \frac{1}{166.\overline{6}}(A + S) - \frac{1}{250}(T + F) = W$

26. $-\frac{1}{500}(P) - \frac{1}{125}(R) - \frac{1}{83.\overline{3}}(B) - \frac{1}{166.\overline{6}}(A + S) + \frac{1}{250}(T + F) = W$

27. $\frac{1}{300}(P) + \frac{1}{75}(R) + \frac{1}{50}(B) + \frac{1}{100}(A + S) - \frac{1}{150}(T + F) = W$

28. $-\frac{1}{300}(P) - \frac{1}{75}(R) - \frac{1}{50}(B) - \frac{1}{100}(A + S) + \frac{1}{150}(T + F) = W$

29. $\frac{1}{1000}(P) + \frac{1}{250}(R) + \frac{1}{166.\overline{6}}(B) + \frac{1}{333.\overline{3}}(A + S) - \frac{1}{500}(T + F) = W$

30. $-\frac{1}{1000}(P) - \frac{1}{250}(R) - \frac{1}{166.\overline{6}}(B) - \frac{1}{333.\overline{3}}(A + S) + \frac{1}{500}(T + F) = W$

31. $\frac{1}{81}(P) + \frac{1}{20.25}(R) + \frac{1}{13.5}(B) + \frac{1}{27}(A + S) - \frac{1}{40.5}(T + F) = W$

32. $-\frac{1}{81}(P) - \frac{1}{20.25}(R) - \frac{1}{13.5}(B) - \frac{1}{27}(A + S) + \frac{1}{40.5}(T + F) = W$

33. $\frac{1}{100}(P) + \frac{1}{25}(R) + \frac{1}{16.\overline{6}}(B) + \frac{1}{33.\overline{3}}(A + S) - \frac{1}{50}(T + F) = W$

34. $-\frac{1}{100}(P) - \frac{1}{25}(R) - \frac{1}{16.\overline{6}}(B) - \frac{1}{33.\overline{3}}(A + S) + \frac{1}{50}(T + F) = W$

35. $\frac{5}{6}(P) + \frac{4}{5}(R) + \frac{3}{4}(B) + \frac{2}{7}(A + S) - \frac{2}{8}(T + F) = W$

36. $-\frac{5}{6}(P) - \frac{4}{5}(R) - \frac{3}{4}(B) - \frac{2}{7}(A + S) + \frac{2}{8}(T + F) = W$

37. $\frac{1}{2}(P) + \frac{1}{3}(R) + \frac{1}{4}(B) + \frac{1}{5}(A + S) - \frac{1}{6}(T + F) = W$

38. $-\frac{1}{2}(P) - \frac{1}{3}(R) - \frac{1}{4}(B) - \frac{1}{5}(A + S) + \frac{1}{6}(T + F) = W$

39. $\frac{1}{2}(P) + \frac{1}{4}(R) + \frac{1}{8}(B) + \frac{1}{16}(A + S) - \frac{1}{32}(T + F) = W$

40. $-\frac{1}{2}(P) - \frac{1}{4}(R) - \frac{1}{8}(B) - \frac{1}{16}(A + S) + \frac{1}{32}(T + F) = W$

Decimals

41. $.1 (P) + .4 (R) + .6 (B) + .3 (A + S) - .2 (T + F) = W$
42. $-.1 (P) - .4 (R) - .6 (B) - .3 (A + S) + .2 (T + F) = W$
43. $.2 (P) + .8 (R) + 1.2 (B) + .6 (A + S) - .4 (T + F) = W$
44. $-.2 (P) - .8 (R) - 1.2 (B) - .6 (A + S) + .4 (T + F) = W$
45. $.3 (P) + 1.2 (R) + 1.8 (B) + .9 (A + S) - .6 (T + F) = W$
46. $-.3 (P) - 1.2 (R) - 1.8 (B) - .9 (A + S) + .6 (T + F) = W$
47. $.4 (P) + 1.6 (R) + 2.4 (B) + 1.2 (A + S) - .8 (T + F) = W$
48. $-.4 (P) - 1.6 (R) - 2.4 (B) - 1.2 (A + S) + .8 (T + F) = W$
49. $.5 (P) + 2.0 (R) + 3.0 (B) + 1.5 (A + S) - 1.0 (T + F) = W$
50. $-.5 (P) - 2.0 (R) - 3.0 (B) - 1.5 (A + S) + 1.0 (T + F) = W$
51. $.6 (P) + 2.5 (R) + 3.6 (B) + 1.8 (A + S) - 1.2 (T + F) = W$
52. $-.6 (P) - 2.5 (R) - 3.6 (B) - 1.8 (A + S) + 1.2 (T + F) = W$
53. $.7 (P) + 2.8 (R) + 4.2 (B) + 2.1 (A + S) - 1.4 (T + F) = W$
54. $-.7 (P) - 2.8 (R) - 4.2 (B) - 2.1 (A + S) + 1.4 (T + F) = W$
55. $.8 (P) + 3.2 (R) + 4.8 (B) + 2.4 (A + S) - 1.6 (T + F) = W$
56. $-.8 (P) - 3.2 (R) - 4.8 (B) - 2.4 (A + S) + 1.6 (T + F) = W$
57. $.9 (P) + 3.6 (R) + 5.4 (B) + 2.7 (A + S) - 1.8 (T + F) = W$
58. $-.9 (P) - 3.6 (R) - 5.4 (B) - 2.7 (A + S) + 1.8 (T + F) = W$
59. $.01 (P) + .04 (R) + .06 (B) + .03 (A + S) - .02 (T + F) = W$
60. $-.01 (P) - .04 (R) - .06 (B) - .03 (A + S) + .02 (T + F) = W$
61. $.001 (P) + .004 (R) + .006 (B) + .003 (A + S) - .002 (T + F) = W$
62. $-.001 (P) - .004 (R) - .006 (B) - .003 (A + S) + .002 (T + F) = W$
63. $.05 (P) + .20 (R) + .30 (B) + .15 (A + S) - .10 (T + F) = W$
64. $-.05 (P) - .20 (R) - .30 (B) - .15 (A + S) + .10 (T + F) = W$

65. $.005\ (P) + .02\ (R) + .03\ (B) + .015\ (A + S) - .01\ (T + F) = W$
66. $-.005\ (P) - .02\ (R) - .03\ (B) - .015\ (A + S) + .01\ (T + F) = W$
67. $.25\ (P) + 1\ (R) + 1.5\ (B) + .75\ (A + S) - .50\ (T + F) = W$
68. $-.25\ (P) - 1\ (R) - 1.5\ (B) - .75\ (A + S) + .50\ (T + F) = W$
69. $.025\ (P) + .1\ (R) + .15\ (B) + .075\ (A + S) - .05\ (T + F) = W$
70. $-.025\ (P) - .1\ (R) - .15\ (B) - .075\ (A + S) + .05\ (T + F) = W$

Fractions and Decimals

71. $.25\ (P) + \frac{1}{12}\ (R) + \frac{1}{24}\ (B) + \frac{1}{6}\ (A + S) - .125\ (T + F) = W$
72. $-.25\ (P) - \frac{1}{12}\ (R) - \frac{1}{24}\ (B) - \frac{1}{6}\ (A + S) + .125\ (T + F) = W$
73. $.2\ (P) + \frac{1}{15}\ (R) + \frac{1}{30}\ (B) + \frac{1}{7.5}\ (A + S) - .1\ (T + F) = W$
74. $-.2\ (P) - \frac{1}{15}\ (R) - \frac{1}{30}\ (B) - \frac{1}{7.5}\ (A + S) + .1\ (T + F) = W$
75. $.1\ (P) + \frac{1}{30}\ (R) + \frac{1}{60}\ (B) + \frac{1}{15}\ (A + S) - .5\ (T + F) = W$
76. $-.1\ (P) - \frac{1}{30}\ (R) - \frac{1}{60}\ (B) - \frac{1}{15}\ (A + S) + .5\ (T + F) = W$
77. $.04\ (P) + \frac{1}{75}\ (R) + \frac{1}{150}\ (B) + \frac{1}{37.5}\ (A + S) - .02\ (T + F) = W$
78. $-.04\ (P) - \frac{1}{75}\ (R) - \frac{1}{150}\ (B) - \frac{1}{37.5}\ (A + S) + .02\ (T + F) = W$
79. $.01\ (P) + \frac{1}{300}\ (R) + \frac{1}{600}\ (B) + \frac{1}{150}\ (A + S) - .005\ (T + F) = W$
80. $-.01\ (P) - \frac{1}{300}\ (R) - \frac{1}{600}\ (B) - \frac{1}{150}\ (A + S) + .005\ (T + F) = W$
81. $\frac{3}{500}\ (P) + .002\ (R) + .\frac{1}{1000}\ (B) + .004\ (A + S) - \frac{3}{1000}\ (T + F) = W$
82. $-\frac{3}{500}\ (P) - .002\ (R) - \frac{1}{1000}\ (B) - .004\ (A + S) + \frac{3}{1000}\ (T + F) = W$
83. $\frac{3}{40}\ (P) + .025\ (R) + .0125\ (B) + \frac{1}{20}\ (A + S) - .0375\ (T + F) = W$
84. $-\frac{3}{40}\ (P) - .025\ (R) - .0125\ (B) - \frac{1}{20}\ (A + S) + .0375\ (T + F) = W$
85. $.06\ (P) + \frac{1}{50}\ (R) + .01\ (B) + \frac{1}{25}\ (A + S) - .03\ (T + F) = W$

86. $-.06\ (P) - \frac{1}{50}\ (R) - .01\ (B) - \frac{1}{25}\ (A + S) + .03\ (T + F) = W$

87. $\frac{1}{10}\ (P) + .0\overline{3}\ (R) + .01\overline{6}\ (B) + .0\overline{6}\ (A + S) - \frac{1}{20}\ (T + F) = W$

88. $-\frac{1}{10}\ (P) - .0\overline{3}\ (R) - .01\overline{6}\ (B) - .0\overline{6}\ (A + S) + \frac{1}{20}\ (T + F) = W$

89. $.15\ (P) + \frac{1}{20}\ (R) + .025\ (B) + \frac{1}{10}\ (A + S) - .075\ (T + F) = W$

90. $-.15\ (P) - \frac{1}{20}\ (R) - .025\ (B) - \frac{1}{10}\ (A + S) + .075\ (T + F) = W$

91. $\frac{3}{10}\ (P) + .1\ (R) + \frac{1}{20}\ (B) + .2\ (A + S) - \frac{3}{20}\ (T + F) = W$

92. $-\frac{3}{10}\ (P) - .1\ (R) - \frac{1}{20}\ (B) - .2\ (A + S) + \frac{3}{20}\ (T + F) = W$

93. $.6\ (P) + \frac{1}{5}\ (R) + .1\ (B) + \frac{2}{5}\ (A + S) - .3\ (T + F) = W$

94. $-.6\ (P) - \frac{1}{5}\ (R) - .1\ (B) - \frac{2}{5}\ (A + S) + .3\ (T + F) = W$

95. $.9\ (P) + .3\ (R) + \frac{3}{20}\ (B) + \frac{3}{5}\ (A + S) - \frac{9}{20}\ (T + F) = W$

96. $-.9\ (P) - .3\ (R) - \frac{3}{20}\ (B) - \frac{3}{5}\ (A + S) + \frac{9}{20}\ (T + F) = W$

Fractions with Positive Exponents

97. $\left(\frac{1}{2}\right)^0 (P) + \left(\frac{1}{2}\right)^1 (R) + \left(\frac{1}{2}\right)^2 (B) + \left(\frac{1}{2}\right)^3 (A + S) - \left(\frac{1}{2}\right)^4 (T + F) = W$

98. $-\left(\frac{1}{3}\right)^0 (P) - \left(\frac{1}{3}\right)^1 (R) - \left(\frac{1}{3}\right)^2 (B) - \left(\frac{1}{3}\right)^3 (A + S) + \left(\frac{1}{3}\right)^4 (T + F) = W$

99. $\left(\frac{1}{4}\right)^0 (P) + \left(\frac{1}{4}\right)^1 (R) + \left(\frac{1}{4}\right)^2 (B) + \left(\frac{1}{4}\right)^3 (A + S) - \left(\frac{1}{4}\right)^4 (T + F) = W$

100. $-\left(\frac{5}{6}\right)^0 (P) - \left(\frac{4}{5}\right)^1 (R) - \left(\frac{3}{4}\right)^2 (B) - \left(\frac{2}{7}\right)^3 (A + S) + \left(\frac{2}{8}\right)^4 (T + F) = W$

Fractions with Negative Exponents

101. $\left(\frac{1}{2}\right)^0 (P) + \left(\frac{1}{2}\right)^{-1} (R) + \left(\frac{1}{2}\right)^{-2} (B) + \left(\frac{1}{2}\right)^{-3} (A + S) - \left(\frac{1}{2}\right)^{-4} (T + F) = W$

102. $-\left(\frac{1}{3}\right)^0 (P) - \left(\frac{1}{3}\right)^{-1} (R) - \left(\frac{1}{3}\right)^{-2} (B) - \left(\frac{1}{3}\right)^{-3} (A + S) + \left(\frac{1}{3}\right)^{-4} (T + F) = W$

103. $\left(\frac{1}{4}\right)^0(P) + \left(\frac{1}{4}\right)^{-1}(R) + \left(\frac{1}{4}\right)^{-2}(B) + \left(\frac{1}{4}\right)^{-3}(A + S) - \left(\frac{1}{4}\right)^{-4}(T + F) = W$

104. $-\left(\frac{5}{6}\right)^0(P) - \left(\frac{4}{5}\right)^{-1}(R) - \left(\frac{3}{4}\right)^{-2}(B) - \left(\frac{2}{7}\right)^{-3}(A + S) + \left(\frac{2}{8}\right)^{-4}(T + F) = W$

Decimals with Positive Exponents

105. $.3^0 (P) + .3^1 (R) + .3^2 (B) + .3^3 (A + S) - .3^4 (T + F) = W$

106. $-.4^0 (P) - .4^1 (R) - .4^2 (B) - .4^3 (A + S) + .4^4 (T + F) = W$

107. $.5^0 (P) + .5^1 (R) + .5^2 (B) + .5^3 (A + S) - .5^4 (T + F) = W$

108. $-.6^0 (P) - .6^1 (R) - .6^2 (B) - .6^3 (A + S) + .6^4 (T + F) = W$

Decimals with Negative Exponents

109. $.3^0 (P) + .3^{-1} (R) + .3^{-2} (B) + .3^{-3} (A + S) - .3^{-4} (T + F) = W$

110. $-.4^0 (P) - .4^{-1} (R) - .4^{-2} (B) - .4^{-3} (A + S) + .4^{-4} (T + F) = W$

111. $.5^0 (P) + .5^{-1} (R) + .5^{-2} (B) + .5^{-3} (A + S) - .5^{-4} (T + F) = W$

112. $-.6^0 (P) - .6^{-1} (R) - .6^{-2} (B) - .6^{-3} (A + S) + .6^{-4} (T + F) = W$

Integers with Positive Exponents

113. $2^4 (P) + 2^3 (R) + 2^2 (B) + 2^1 (A + S) - 2^0 (T + F) = W$

114. $-3^4 (P) - 3^3 (R) - 3^2 (B) - 3^1 (A + S) + 3^0 (T + F) = W$

115. $4^4 (P) + 4^3 (R) + 4^2 (B) + 4^1 (A + S) - 4^0 (T + F) = W$

116. $-5^4 (P) - 5^3 (R) - 5^2 (B) - 5^1 (A + S) + 5^0 (T + F) = W$

117. $6^4 (P) + 6^3 (R) + 6^2 (B) + 6^1 (A + S) - 6^0 (T + F) = W$

Integers with Negative Exponents

118. $2^0 (P) + 2^{-1} (R) + 2^{-2} (B) + 2^{-3} (A + S) - 2^{-4} (T + F) = W$

119. $-3^0 (P) - 3^{-1} (R) - 3^{-2} (B) - 3^{-3} (A + S) + 3^{-4} (T + F) = W$

120. $4^0 (P) + 4^{-1} (R) + 4^{-2} (B) + 4^{-3} (A + S) - 4^{-4} (T + F) = W$

121. $-5 (P) - 5^{-1} (R) - 5^{-2} (B) - 5^{-3} (A + S) + 5^{-4} (T + F) = W$

122. $6^0 (P) + 6^{-1} (R) + 6^{-2} (B) + 6^{-3} (A + S) - 6^{-4} (T + F) = W$

Roots

123. $\sqrt{121} (P) + \sqrt{100} (R) + \sqrt{81} (B) + \sqrt{64} (A + S) - \sqrt{49} (T + F) = W$

124. $-\sqrt{121} (P) - \sqrt{100} (R) - \sqrt{81} (B) - \sqrt{64} (A + S) + \sqrt{49} (T + F) = W$

125. $\sqrt{144} (P) + \sqrt{64} (R) + \sqrt{49} (B) + \sqrt{36} (A + S) - \sqrt{1} (T + F) = W$

126. $-\sqrt{144} (P) - \sqrt{64} (R) - \sqrt{49} (B) - \sqrt{36} (A + S) + \sqrt{1} (T + F) = W$

127. $\sqrt[3]{125} (P) + \sqrt[3]{64} (R) + \sqrt[3]{27} (B) + \sqrt[3]{8} (A + S) - \sqrt[3]{1} (T + F) = W$

128. $-\sqrt[3]{125}\,(P) - \sqrt[3]{64}\,(R) - \sqrt[3]{27}\,(B) - \sqrt[3]{8}\,(A + S) + \sqrt[3]{1}\,(T + F) = W$

129. $\sqrt{25}\,(P) + \sqrt[3]{64}\,(R) + \sqrt[4]{81}\,(B) + \sqrt[5]{32}\,(A + S) - \sqrt[6]{1}\,(T + F) = W$

130. $-\sqrt{25}\,(P) - \sqrt[3]{64}\,(R) - \sqrt[4]{81}\,(B) - \sqrt[5]{32}\,(A + S) + \sqrt[6]{1}\,(T + F) = W$

Factorials and Summations

131. $6!\,(P) + 5!\,(R) + 4!\,(B) + 3!\,(A + S) - 2!\,(T + F) = W$

132. $-6!\,(P) - 5!\,(R) - 4!\,(B) - 3!\,(A + S) + 2!\,(T + F) = W$

133. $\left(\sum_{j=1}^{6} j\right)(P) + \left(\sum_{j=1}^{5} j\right)(R) + \left(\sum_{j=1}^{4} j\right)(B) + \left(\sum_{j=1}^{3} j\right)(A + S) - \left(\sum_{j=1}^{2} j\right)(T + F) = W$

134. $-\left(\sum_{j=1}^{6} j\right)(P) - \left(\sum_{j=1}^{5} j\right)(R) - \left(\sum_{j=1}^{4} j\right)(B) - \left(\sum_{j=1}^{3} j\right)(A + S) + \left(\sum_{j=1}^{2} j\right)(T + F) = W$

Fractions, Decimals, Summations, Factorials, Exponents, Roots

135. $\left(\sum_{j=1}^{4} j\right)(P) + 3!(R) + \sqrt[3]{64}\,(B) + \left(\frac{1}{2}\right)^{-2}(A + S) - .025\,(T + F) = W$

136. $-\left(\sum_{j=1}^{4} j\right)(P) - 3!\,(R) - \sqrt[3]{64}(B) - \left(\frac{1}{2}\right)^{-2}(A + S) + .025\,(T + F) = W$

137. $\left(\sum_{j=1}^{3} j\right)(P) + \sqrt[3]{27}\,(R) + \left(\frac{2}{5}\right)^{-1}(B) + \left(\frac{5}{6}\right)^{0}(A + S) - \left(\sqrt[4]{16}\right)^{-2}(T + F) = W$

138. $-\left(\sum_{j=1}^{3} j\right)(P) - \sqrt[3]{27}(R) - \left(\frac{2}{5}\right)^{-1}(B) - \left(\frac{5}{6}\right)^{0}(A + S) + \left(\sqrt[4]{16}\right)^{-2}(T + F) = W$