Answer Key

Technology Lab Recording Sheet 1-4
Think and Discuss

1. Both use a number greater than or equal to 1 but less than 10 for the first factor and a power of 10 for second factor. “E” could stand for the exponent.

Try This

1. 6.5×10^6
2. 1.5×10^7
3. 3.6×10^{11}
4. 2.8×10^4
5. 8.1×10^3
6. 2.5×10^{10}
7. 6.3×10^3
8. 3×10^6
9. 1×10^5

Technology Lab Recording Sheet 1-5
Think and Discuss

1. Yes. The grouping symbol has no effect on the answer.

Try This

1. 29
2. 39
3. 36
4. 12
5. 64
6. 0.28
7. 0.38
8. 0.04

Think and Discuss

1. $82 + 7 - 2 \cdot 6 \cdot 13 = -67$, when computed by a scientific calculator without parentheses. The scientific calculator performs all multiplication before addition and subtraction, yielding an answer different from a conventional calculator, which does not contain the order of operations in its programming. In Activity 1 the conventional calculator computed the product at 6786.
2. Any expression in which addition or subtraction precedes multiplication or division will be computed differently by conventional and scientific calculators.

Try This

1. $(7 \cdot 4) + (3 \cdot 2) - (6 \div 3) = 32$

Technology Lab 2-4
Think and Discuss

1. Two negatives multiplied by a positive yields a positive. One negative and two positives yields a negative. Two negatives and two positives yields a positive. Generally stated, there must be an even number of negative numbers in the expression to yield a positive product. If there are an odd number of negative numbers, the product is negative.
2. The sign of the product changes with how many numbers are multiplied. When all the numbers are negative, an even number of factors makes the product positive. An odd number of factors makes the product negative.

Try This

1. 1,625,910
2. 7,776
3. −6
4. −380

Technology Lab 2-9
Think and Discuss

1. 1.5 mi or $1\frac{1}{2}$ mi; calculator keystrokes will vary.

Try This

1. $\frac{32}{3} = 10.\overline{6}$
2. $\frac{17}{4} = 4.25$
3. $\frac{121}{7} = 17.28571429$
4. $\frac{1310}{13} = 100.7692308$
5. $\frac{32}{9} = 3.\overline{5}$

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Answer Key

Technology Lab 2-10
Think and Discuss

1. $\frac{3}{4} = 0.75$ and $0.75 > 0.7$ Trial 2 is longer than Trial 1.

Try This

1. $0.41\overline{6}$
2. 0.15
3. 0.75
4. 0.3
5. $0.\overline{4}$

Technology Lab 3-2
Think and Discuss

1. The decimals would be rounded off to the hundredths. This means the sums would be slightly larger because more of the decimals end with 5 or higher in the thousandths place. This would make the hundredths place round up.

Technology Lab 3-10
Think and Discuss

1. 7 [+] 9 [÷] 11

Try This

1. 1.433333333
2. 0.1538461538
3. 10.48484848
4. 8.854166667

Technology Lab 3-12
Think and Discuss

1. One-fourth the difference of h and 9 is 6. You solve the equation by multiplying both sides by 4, then adding 9 to both sides. This gives you $h = 33$.

Try This

1. The number is 6,000. Check student's key sequences.

Technology Lab 4-1
Think and Discuss

1. Possible answer: If the points you want to plot have coordinates greater than 10 or less than −10, you will need to change the window to see all the points.

Try This

1. Four points are visible. Two of the points have coordinates greater than 10.

Technology Lab 4-6
Think and Discuss

1. Possible answer: The graph appears changed because the axes are scaled differently. The graph is correct and still accurately represents the equation. The graph looks different because of the change in scale.

Try This

1. Use standard viewing window.
2. Use standard viewing window.
3. Use standard viewing window.
4. Use standard viewing window.
5. Choice of window may vary, but it should include both x- and y- intercepts.
6. Use standard viewing window.

Technology Lab 4-6A
Think and Discuss

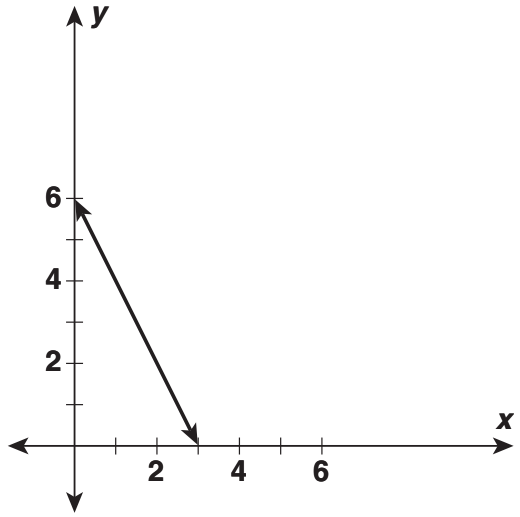
1. The coordinates (0, 0) are not a solution to the equation. The point (0, 0) represents $y = 0$ and $x = 0$, however, $y = 3 + 0 = 3$. The reason for this is that the taxi driver charges a meter charge just for getting in the cab. Even before you have gone any distance (i.e., 0 on the x-axis), you will have to pay \$3.00 (i.e., 3 on the y-axis). This means that the graph begins with the point (0, 3).

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Answer Key

Try This

1. The line intersects the *y*-axis at 6 and intersects the *x*-axis at 3.



Technology Lab 5-1
Think and Discuss

1. Possible answer: Virtually all businesses use averages in some way. Averages are especially important to insurance companies (average cost per car wreck), media companies (viewing per show), and political consultants (number of persons holding an opinion).

Technology Lab 5-2
Think and Discuss

1. To solve for an unknown denominator *d*, write the following formula in Cell D2: = C2*D1/C1. Students might wish to use Columns E and F for the denominator formula, in which case F2 should contain the formula = E2*F1/E1.

Try This

1. 12
2. $23.333\overline{3}$
3. 60
4. $364.166\overline{6}$

Technology Lab 5-3
Think and Discuss

1. Possible answer: When you look at the changes during equal intervals on a graph you can determine if the rate of change is constant or variable. If the change during equal intervals on a graph is always the same then the rate is constant. If the change during equal intervals on a graph is different in some of the intervals then the rate of change is variable.
2. If the equation is linear, the rate of change will be constant. If the equation is not linear, the rate of change will be variable.

Try This

1. The equation $y = x - 3$ is linear. The graph is a line and shows a constant rate of change. The equation $y = x^2 - 3$ is not linear. The graphs is shaped like a U and shows a variable rate of change.

   The equation $y = x^3 - 3$ is not linear. The graph is curved and goes from Quadrant III through (0, −3) and up through Quadrant I.

Technology Lab 5-5
Think and Discuss

1. 3 square miles • $\frac{27{,}878{,}400 \text{ square feet}}{1 \text{ square mile}} \cdot \frac{1 \text{ acre}}{43{,}560 \text{ square feet}}$

   = 1,920 acres

Try This

1. Multiply 12 ounces by 115 cows to obtain the total number of ounces desired = 1,380 oz. Convert 1,380 ounces to quarts: 1,380 oz × 1 cup/ 8 oz × 1 pt/ 2 cups × 1 quart/ 2 pints = 43.125 quarts.

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Solve for the number of scoops with the proportion: 1.5 scoops/ 2 qt = n scoops/ 43.125 qt, where n = 32.34375 scoops. Since there are 15 scoops per container, the rancher should buy 3 containers because two containers would hold only 30 scoops, and he needs a little over 32 scoops.

Technology Lab 6-5
Think and Discuss

1. Step 1: Write an equation or proportion: $\frac{N}{100} = \frac{700}{500}$
   Step 2: Solve for the variable. Since the part is greater than the whole, the rate is greater than 100%; The answer is 140%.

Try This

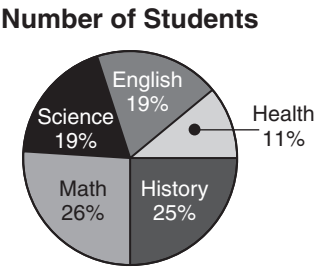
1. 85%
2. 8%

Technology Lab 6-5A
Think and Discuss

1. Possible answer: with a circle graph you can compare the percent of one type of video rented with the percents of other types, as well as with the total number of videos rented.

Try This

1.



Technology 6-7
Think and Discuss

1. After each payment of principle is applied to the loan balance, you are paying interest on slightly less principle. This means that the amount of interest you are paying each time decreases.

Try This

1. $24
2. $34
3. $20

Technology Lab 7-2
Think and Discuss

1. Possible answer: the **min** function will find the minimum, or lowest value. The **max** function will find the maximum, or highest, value.

Try This

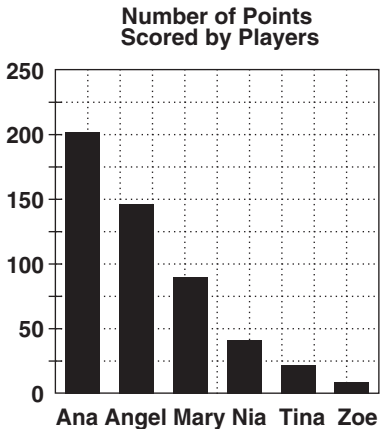
1. mean: 4.75; median: 5
2. mean: 67.5; median: 70

Technology Lab Recording Sheet 7-6
Think and Discuss

1. Possible answer: The bar graph best displays the Student Council Budget because it displays the amounts budgeted for each activity in an easy to read format.
2. A line graph would not be an appropriate display of the data because the data does not occur over time. A line graph is for showing changes in data over time.

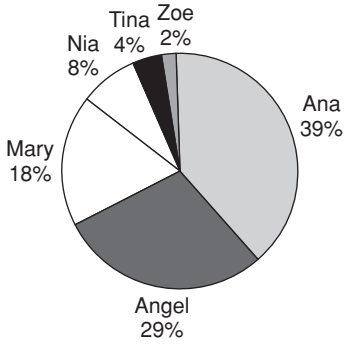
Try This

1.



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Number of Points Scored by Players



2. Possible answer: The bar graph is a better display of data because the scores are for one game and not over time.

Technology Lab 7-8
Think and Discuss

1. Possible answer: INT
2. Possible answer: the formula produces integers between 0 and 9.
3. Possible answer: You can list the names of the people in the first column. Count the number of names and generate that number of random whole numbers in the second column.

Try This

1. Check students' random numbers.
   = (10*RAND( )) + 1
2. Check students' random numbers.
   = INT (20*RAND( )).
3. Check students' random numbers.
   = (25*RAND( ))

4a. = INT(8*RND( )) + 1

b. Possible answer: 2, 3, 3, 6, 5; no

Technology Lab Recording Sheet 7-9
Think and Discuss

1. As height increases, length of foot increases.
2. Possible answers: As height increases, age increases and length of forearm increases; no relationship between height and month of birth.

Activity 1
Try This

1. Answers will vary. It is expected that the variables for height, age, and length of forearm will show a positive correlation, and that the variables for height and month of birth will show no correlation.

Activity 2
Think and Discuss

1. Answers will vary. The more data points you have, the easier it is to draw a line that is close to most of the data.
2. A sample from one class would most likely be representative of the students in a grade if the students are placed in classes randomly.

Anwers to *Try This*

1. **a.** Anwers will vary.

   b. Check students' work: Possible answer: This sample is a convenience sample. The students sitting nearby may not be representative of the 30 classmates. For example, the mean height of three students sitting nearby may be greater if the students are all on the basketball team.

   c. Check students' work. Possible answer: The mean height of 15 students is closer to the mean height of the entire population than the mean height of three students is. This is because 15 students is a larger sample of the population.

Technology Lab 8-2
Think and Discuss

1. 90°
2. 52°
3. 38°
4. $m\angle BDE = 52°$, and $m\angle AEC = 90°$; The sum of the interior angles of a triangle is 180°. So, $180 - 90 - 52 = m\angle DBE = 38°$.

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Answer Key

Try This

1. Check student's drawing.
2. Check student's drawing.

Technology Lab 8-6
Think and Discuss

1. 180°
2. no
3. yes

Try This

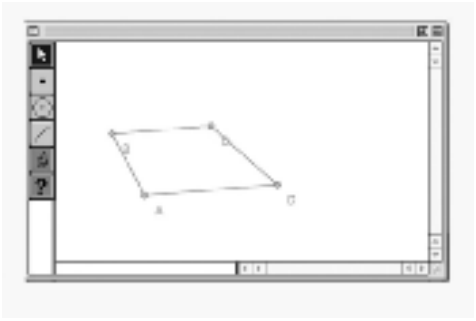
1. Check student's drawing.
2. Check student's drawing.
3. Check student's drawing. 60°

Technology Lab Recording Sheet 8-10
Think and Discuss

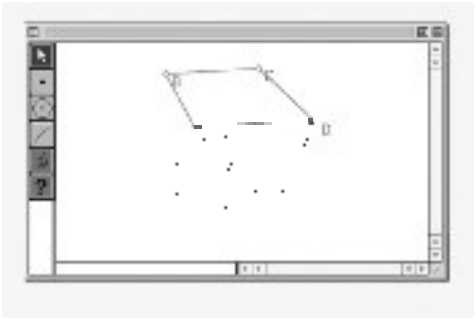
1. No; no matter which direction the triangle is translated, the vertices of the triangle will always have the same orientation.
2. 360°

Try This

1a.



1b.



Technology Lab 9-2
Think and Discuss

1. The diameter of a circle is two times the radius of the circle. Since the formula for circumference uses a circle's radius, you have to change the formula in order to use diameter: $C = \pi \cdot 2.8 = 8.8$. The circumference is 8.8 cm. It is half of the circumference calculated above.

Try This

1. 13.8 cm
2. 22.35 cm
3. 87.96 cm
4. 47.12 cm
5. 7.85 cm

Technology Lab 9-5
Think and Discuss

1. First you need to remember the formula for the circumference of a circle. You have the value for pi and the value for the circumference, so you work backwards to find the radius. Once you have the radius, you can plug that into the formula for finding the area of the circle.
2. $r = \frac{64}{2\pi} = 10.186$
   $A = \pi(10.186)^2$
   The area is 325.95 cm^2.

Try This

1. $A = 153.94\ cm^2$.
2. $A = 38.48\ cm^2$.
3. $A = 7.9\ cm^2$.

Technology Lab 9-6
Think and Discuss

1. Possible answer: Yes, a translated polygon is congruent to the original polygon. Therefore, the area and the perimeter will be the same for both.

Try This

1. No, the perimeter of triangle *DEF* is not twice the perimeter of triangle *ABC*. Doubling the area does not double the perimeter.

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2. The sum of the areas of the three triangles is the same as the area of *ABCDE*.

Technology Lab 9-7
Think and Discuss

1. Perfect squares result from whole numbers such as 5; values such as 7.3 will not be perfect squares.
2. $5.74 = \sqrt{33}$, and $7.48 = \sqrt{56}$

Try This

$18^3 = 5{,}832$; $5^3 = 125$; $11^3 = 1331$; $\sqrt[3]{216000} = 60$; $\sqrt[3]{8} = 2$; $\sqrt[3]{1725} = 11.99305153$

Technology Lab 10-2
Think and Discuss

1. The volume will quadruple because the square of the radius is used to calculate the volume: For $r = 3 : 3^2 = 9$; for $6 : 6^2 = 36$; and $9 : 36 = 1{:}4$.

Try This

1. $V = 1{,}231.23\ \text{cm}^3$
2. $V = 35.937\ \text{cm}^3$
3. $V = 1{,}357.17\ \text{cm}^3$
4. $V = 2{,}723.76\ \text{cm}^3$

Technology Lab 10-3
Think and Discuss

1. The volume is eight times higher when the radius is doubled: When $r = 3 \rightarrow r^3 = 27$; When $r = 6 \rightarrow r^3 = 216$; $27 : 216 = 1{:}\ 8$. The volume is about $904.8\ \text{cm}^3$.

Try This

1. $20.53\ \text{cm}^3$
2. $359.19\ \text{cm}^3$
3. $33.51\ \text{cm}^3$

Technology Lab 10-4
Think and Discuss

1. You would have to write down the subtotals and then re-enter them to add them.
2. You could calculate $(3 \times 5 + 3 \times 7 + 5 \times 7)$ and then multiply by 2.

Try This

$502.6548246\ \text{cm}^2$

Technology Lab 10-5
Activity 1
Think and Discuss

1. By doubling the length of the base, you are multiplying the volume by 2, and by halving the height, you are dividing the volume by 2. Multiplying and dividing by the same number leaves the value unchanged.
2. Possible answer: You could multiply the length of the base by a number and divide the width of the base by that same number.

Try This

1. a. $67.28\ \text{in}^3$

   b. $853.69\ \text{in}^3$
2. $269.12\ \text{in}^3$; $3{,}414.75\ \text{in}^3$

Technology Lab 11-2
Think and Discuss

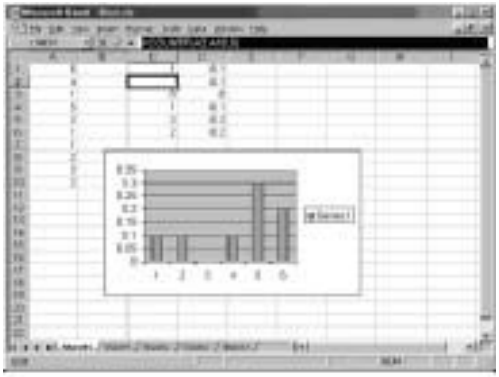
1. Use the Fill-Down function to copy the randomize formula to cells A1 through A100.
2. The formula for counting occurrences is = COUNTIF (A1:A100, *any number 1 through 6*). The formula for experimental probability is = *Cn*/100.

Try This

1. Fill-Down the formula in A1 through A1000. Adapt the counter for 1000 rolls (=COUNTIF (A1: A 1000, *INT*). Adapt for experimental probability: (=Cn/1000).
2. Highlight cells D1 through D6. Choose Chart from the insert menu. The sheet will automatically chart the results and display them in form of the student's choosing. An example for 10 rolls is shown below.

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Answer Key



Technology Lab 11-7
Think and Discuss

1. To account for the various combinations available, divide the permutation odds (11,441,304,000) by the product of the number of picks:

$$\frac{11{,}441{,}304{,}000}{6 \times 5 \times 4 \times 3 \times 2 \times 1} = 15{,}890{,}700.$$

The scientific calculator will perform the operation with the following keystrokes: 50 nCr 6 =. The odds of picking the correct combination are 15,890,700 to 1.

Try This

1. 26 × 25 × 24 × 23 × 22 × 21 = 165,765,600. The scientific calculator will perform the operation with the following keystrokes: 26 nPr 6 = 165,765,600. The odds of picking the correct permutation are 1 to 165,765,599.
2. $\frac{26 \times 25 \times 24}{3 \times 2 \times 1} = 2{,}600$
The scientific calculator will perform the operation with the following keystrokes: 26 nCr 3 = 2,600. The odds of picking the correct combination are 1 to 2,599.

Technology Lab 11-7A
Think and Discuss

1. Check students' work. For the T1-83 the greatest factorial that does not give and answer in scientific notation is 13! = 6,227,020,800.
2. Answer: No; 3! 2! = 6 • 2 = 12, while (3 • 2)! = 6! = 720.

Try This

1. 120
2. 40,320
3. 3,628,800
4. 479,001,600
5. 1,663,200
6. 360,360

Technology Lab 12-2
Think and Discuss

1. The point of intersection for the two lines is the point where the *x*-value and *y*-value is the same for both equations.
2. (2 X,T,θ,n + 6) ÷ 3

Try This

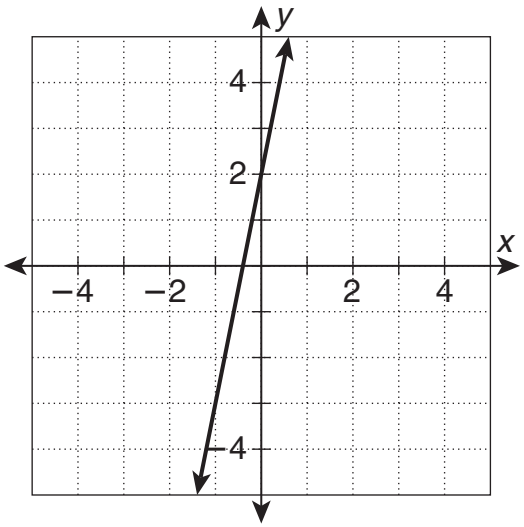
1. $x = 2$
2. $x = 23$
3. $x = 4$
4. $x = 10$

Technology Lab 12-2A
Think and Discuss

1. 5 × 8 + 4 = 3 × 8 + 20, 40 + 4 = 24 + 20, 44 = 44
2. The solution to the equations is the *y*-coordinate of intersection for both lines. This means that the lines intersect at (8, 44).

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Try This

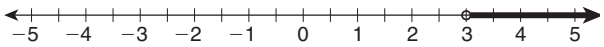
1. $m = 7$
2. 

Technology Lab 12-4
Think and Discuss

1. Any number greater than 15 is a solution to the inequality.
2. In the equation for the activity, 15 is not included in the solution set. In the equation $x - 9 \geq 6$, 15 is included in the solution set.

Try This

1. $a > 3$



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