

# Mathematics

## Diagnostic Tests 500-800



Sunrise Edition

**Teacher's  
Manual**





MATH 500-800 DIAGNOSTIC TESTS, TEACHER'S MANUAL

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# MATH 500-800 DIAGNOSTIC TESTS

## TEACHER'S MANUAL

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The material in this book is  
the product of the Lord's blessing  
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at Christian Light Publications.



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## Note!

As we produce new math curriculum, some diagnostic tests become outdated. Make certain you have the correct booklet for the year you are testing.

### A Note About Diagnostic Testing for Sunrise Math

Diagnostic testing in Sunrise Math is different from diagnostic testing in CLE's unrevised Math.

Sunrise Math uses an incremental, mixed concept approach throughout each level. The diagnostic tests evaluate performance by concepts. There is no accurate way to discern which LightUnits contain all the concepts which the student needs to have mastered in order to catch up to the next level. For this reason, it is advisable to place students at the beginning of the grade level for which he received a satisfactory score according to our recommendations below.

However, if a student's score on a particular grade level is only slightly below our recommended score for adequate performance in that level, you may want to take a second look at the concepts tested. The student may be weak in only one or two areas. For example, algebra and geometry concepts in Sunrise Math tend to be a little more advanced than those in some other widely-used curricula. If the student is competent in all other areas, and you are willing to spend extra time doing necessary remedial work with this student in the concepts he has never mastered, you are probably safe to place him in that particular level even if his total score is below the one recommended.

A student whose total score is well below the recommended level for proficiency will only be frustrated by being pushed into a higher level than recommended. However, if it is important that he catch up to his "correct" grade level due to his age or parental or school expectations, he may be able to complete several lessons a day, skipping some of the daily review work which he has already sufficiently mastered. This suggestion might work well for a student with good reading comprehension skills and a strong motivation to learn on his own.

These diagnostic tests are intended to give you an accurate idea of where the student should begin in the curriculum in order to maximize the satisfaction and ease of use for both student and teacher.

**For Levels 500-800 (Sunrise Math)** The different concepts in *Sunrise Edition* are learned incrementally and spread throughout the year. The activities in the tests are grouped by concepts. The student should begin with the first concept and do as many activities as possible in each group.

## How Do I Score the Test?

Using the answers in this manual, put a mark through the number of each question the student answered incorrectly.

**For Levels 500-800 (Sunrise Math).** Determine the number of activities done correctly for the level.

## How Do I Then Determine Placement?

Use the *Diagnostic Test Summary* page found in the beginning of the student booklet.

1. Fill in the **Diagnostic Test Summary** on page vi. If you are enrolled with Homeschool Plus at Christian Light Education, also fill in the second summary sheet on page viii. Tear out this perforated sheet and send it to Homeschool Plus and retain a copy for yourself. If you are not enrolled with Homeschool Plus, ignore the extra summary sheet.
2. **For Level 500 (Sunrise Math).** If the student has 88 or more correct answers, he is prepared for Level 600. If less than 88 are correct, the student is not prepared for Level 600 and should begin with *Sunrise Math Level 500*.
3. **For Level 600 (Sunrise Math).** If the student has 70 or more correct answers, he is prepared for Level 700. If less than 70 are correct, the student is not prepared for Level 700 and should begin with *Sunrise Math Level 600*.
4. **For Level 700 (Sunrise Math).** If the student has 70 or more correct answers, he is prepared for Level 800. If less than 70 are correct, the student is not prepared for Level 800 and should begin with *Sunrise Math Level 700*.
5. **For Level 800 (Sunrise Math).** If the student has 72 or more correct answers, he is prepared for level 900. If less than 72 are correct, the student is not prepared for Level 900 and should begin with *Sunrise Math Level 800*.

**Note:** *Successful completion of Sunrise Math 800 diagnostic test means the student is ready to enter Sunrise 900. But, since the Sunrise Math 900 is still undergoing development, successful completion can be used to enter the CLE unrevised level 900 or other compatible Algebra I courses.*

Diagnostic Test Summary Math 500-800	
Name _____	Date _____
LightUnit	Amount Correct
Level 500	_____
Level 600	_____
Level 700	_____
Level 800	_____
Performance Level-Student will begin with Level _____	

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If you have questions or need further assistance, feel free to contact CLE by phone (540-434-0750), FAX (540-433-8896), E-mail (homestudy @clp.org), or write us at P.O. Box 1212, Harrisonburg, VA 22803-1212



# Answers for Level 500

## Sunrise Edition

1. 25
2. 81
3. 4
4.  $4^2$
5.  $7^2$
6.  $10^2$
7.  $5 + 48$   
53
8.  $25 \div 5 + 3 \times 2$   
 $5 + 3 \times 2$   
 $5 + 6$   
11
9. 2
10. -8
11. 0
12.  $\frac{-3}{n} = \frac{-3}{6}$
13.  $n + 3 = 9$   
 $6 + 3 = 9$   
 $9 = 9$
14.  $\frac{+4}{n} = \frac{+4}{13}$
15.  $n - 4 = 9$   
 $13 - 4 = 9$   
 $9 = 9$
16. 36 pints of jam
- |      |   |     |
|------|---|-----|
| 38   | 3 | 36  |
| 44   | ) | 108 |
| + 26 |   | 9   |
| 108  |   | 18  |
|      |   | 18  |
|      |   | 0   |
17. 32 coconut cakes
- |    |   |     |
|----|---|-----|
| 32 |   |     |
| 5  | ) | 160 |
| 15 |   |     |
| 10 |   |     |
| 10 |   |     |
| 0  |   |     |
18. 90.187
- |          |
|----------|
| 43.000   |
| 4.587    |
| + 42.600 |
| 90.187   |
19. 87.851
- |         |
|---------|
| 93.010  |
| - 5.159 |
| 87.851  |
20. 0.053
21. 0.12
22. 0.05900
23. 0.426
24. 0.50 or 0.5
25. 0.75
26. 0.25
27. 0.003
28. 0.0123
29. 47.2
30. 230
31. 4,600
32. 6
33. b
34. c
35. a
36. c
37. a
38. b
39. 973 R3
40. 403 R3
41. 157 R2
42. \$6.52
43. 55 R26
44. 8 R9
45. 44 R33
46.  $3\frac{1}{3}$
47.  $15\frac{13}{24}$
48.  $6\frac{4}{9}$
49.  $3\frac{1}{2}$
50. 30
51.  $9\frac{1}{3}$

**Level 500**

52.  $\frac{8}{15}$

53.  $\frac{1}{6}$

54.  $\frac{9}{13}$

55.  $\frac{8}{9}$

56.  $A = s^2$   
 $A = 4 \times 4$   
 $A = 16 \text{ ft}^2$

57.  $A = l \times w$   
 $A = 6 \times 3$   
 $A = 18 \text{ in}^2$

58.  $A = \frac{1}{2} \times (b \times h)$   
 $A = \frac{1}{2} \times (5 \times 4)$   
 $A = \frac{1}{2} \times 20$   
 $A = 10 \text{ cm}^2$

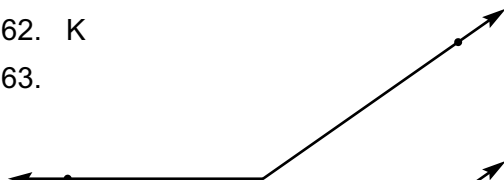
59.  $C = \pi \times d$   
 $C = 31.4 \times 10$   
 $C = 31.4 \text{ m}$

60. 70

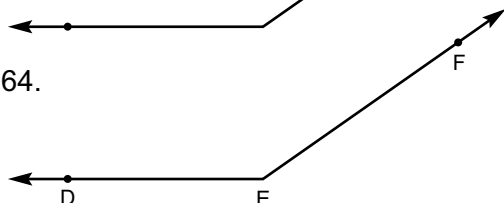
61.  $\angle JKL$  or  $\angle LKJ$

62. K

63.



64.



65. no

66. A

67. A

68. C

69. 360

70. 180

71. 29 m

72. 5

73. 7

74. 3

75. 5

76. 9

77. 3,000,000,000,425

78. 0.026

79. <

80. =

81. >

82. 0.02, 0.2, 0.205, 0.225

83. b

84. a

85-88.

Fraction	$\frac{1}{2}$ or $\frac{50}{100}$	$\frac{38}{100}$	$\frac{3}{4}$	$\frac{1}{4}$
Decimal	0.5 or 0.5	0.38	0.75	0.25
Percent	50%	38%	75%	25%

89.  $\frac{35}{100}$  35%

90.  $\frac{24}{100}$  24%

91.  $\frac{80}{100}$  80%

92.  $\frac{2}{3}$   $\frac{10}{15}$

93.  $\frac{9}{5}$   $\frac{45}{25}$

94.  $\frac{5}{15}$   $\frac{1}{3}$

95.  $\frac{6}{4}$   $\frac{3}{2}$

96. 36 ounces

$\frac{96 \text{ ounces}}{8 \text{ children}} = \frac{36 \text{ ounces}}{3 \text{ children}}$

97. 6 minutes

$\frac{3 \text{ cm}}{2 \text{ min}} = \frac{9 \text{ cm}}{6 \text{ min}}$

98. 4,300

99. 5,000

100. 3,300

101. 2,240

102. 0.36

103. 0.92

104. 0.614

105. 0.253

106. 0.2

107. 0.4

108. 3

109. 5

# Answers for Level 600

## Sunrise Edition

1. equilateral
2. scalene
3. isosceles
4. c, or the third triangle
5. 90
6. 35
7. 55
8. 180
9. 360
10. 360
11.  $\overline{AC}$ ,  $\overline{EN}$  or  $\overline{CA}$ ,  $\overline{NE}$
12. Figure 2
13. 0, 90
14. 180
15. 90, 180
16. edge
17. face
18. vertex
19. face
20. 11 inches  
 $C = \pi d$   
 $C = \frac{22}{7} \times 3\frac{1}{2}$   
 $C = 11$
21.  $12.56 \text{ in}^2$   
 $A = \pi r^2$   
 $A = 3.14 (2 \times 2)$   
 $A = 3.14 \times 4$   
 $A = 12.56$
22.  $6 \text{ m}^3$   
 $V = l \times w \times h$   
 $V = 3 \times 1 \times 2$   
 $V = 6$
23. 28 m  
 $P = 2l + 2w$   
 $P = 2 \times 9 + 2 \times 5$   
 $P = 18 + 10$   
 $P = 28$
24. 56 ft  
 $P = 2l + 2w$   
 $P = 2 \times 21 + 2 \times 7$   
 $P = 42 + 14$   
 $P = 56$
25. 21 R42
26. 6 R366
27. 21 R302
28. 0.67
29. 2.43
30.  $0.8\overline{6}$
31.  $1.2\overline{7}$
32. 42
33. 12.5
34. 2.3
35. 0.44
36. 1.65
37. 3.40 or 3.4
38. 0.30 or 0.3
39. 23%
40. 80%
41. 213%
42. 560%
43.  $\frac{70}{100}$ ;  $\frac{7}{10}$
44.  $2\frac{60}{100}$ ;  $2\frac{3}{5}$
45. 1.22; 122%
46. 0.63; 63%
47. \$8.66
48. \$11.42
49. \$50.35
50.  $\frac{2}{7}$
51.  $22\frac{1}{2}$
52.  $6\frac{3}{4}$
53.  $5 \cdot 3$   
15
54. 21

**Level 600**

55.  $4x + 10$

56.  $6 \cdot 10$   
60

57.  $\frac{10}{2}$   
5

58.  $\frac{30}{10}$   
3

59.  $4 \cdot 10 + 3$   
 $40 + 3$   
43

60.  $5n - 30 = 10$   
    +30 +30  
 $\frac{5n = 40}{5 \quad 5}$   
 $n = 8$

61.  $5 \times 8 - 30 = 10$   
 $40 - 30 = 10$   
 $10 = 10$

62.  $7b + 17 = 45$   
    -17 -17  
 $\frac{7b = 28}{7 \quad 7}$   
 $b = 4$

63.  $7 \times 4 + 17 = 45$   
 $28 + 17 = 45$   
 $45 = 45$

64.  $b + a$

65.  $b \cdot a$

66.  $a + (b + c)$

67.  $a \cdot (b \cdot c)$

68.  $6y + 24$

69.  $14a + 28$

70. 3

71. 108

72. 30

73. 150

74. 58%

75. 64

76. 16

77. -11

78. 3

79. 0

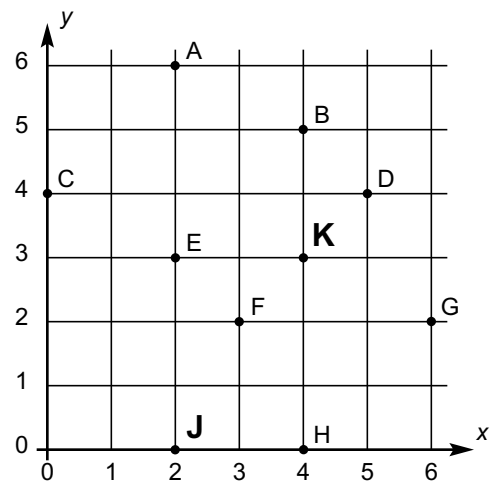
80. (3, 2)

81. (4, 0)

82. E

83. C

84, 85.



86.  $2 \cdot 3 \cdot 5 \cdot 7$

87.  $2 \cdot 2 \cdot 2 \cdot 3 \cdot 3$

# Answers for Level 700

## Sunrise Edition

1.  $-2 + (+14) = 12$

2.  $5 + (-24) = -19$

3.  $3 + (+6) = 9$

4. 32

5. -20

6. -15

7. -9

8. 7

9. 5

10. -5

11. 9

12. -11

13.  $10n$

14.  $21c$

15.  $72y$

16.  $28x$

17.  $49 - 5 + 9 \cdot 8$

$49 - 5 + 72$

$44 + 72$

116

18.  $12 - 5 \cdot 2$

$12 - 10$

2

19.  $64 - 14(3)$

$64 - 42$

22

20-22. Number of steps in solutions may vary.

20.  $\frac{3}{4} \div 3\frac{1}{2}$

$\frac{3}{4} \cdot \frac{2}{7} = \frac{3}{14}$

21.  $5 \div 2\frac{1}{2}$

$\frac{5}{1} \cdot \frac{2}{5} = \frac{2}{1} = 2$

22.  $\frac{3}{4} \div 12$

$\frac{3}{4} \cdot \frac{1}{12} = \frac{1}{16}$

23.  $12 + \frac{n}{5} = 22$

$\frac{-12}{-12} \quad \frac{-12}{-12}$

$\frac{n}{5} = 10$

$\frac{n}{5} \cdot 5 = 10 \cdot 5$

$n = 50$

24.  $12 + \frac{50}{5} = 22$

$12 + 10 = 22$

$22 = 22$

25.  $17 = \frac{n}{2} + 11$

$\frac{-11}{-11} \quad \frac{-11}{-11}$

$6 = \frac{n}{2}$

$6 \cdot 2 = \frac{n}{2} \cdot 2$

$12 = n$

26.  $17 = \frac{12}{2} + 11$

$17 = 6 + 11$

$17 = 17$

27.  $5n - 8 = 14$

$\frac{+8}{+8} \quad \frac{+8}{+8}$

$\frac{5n}{5} = \frac{22}{5}$

$n = 4\frac{2}{5}$

28.  $6n + 8 = 13$

$\frac{-8}{-8} \quad \frac{-8}{-8}$

$\frac{6n}{6} = \frac{5}{6}$

$n = \frac{5}{6}$

**Level 700**

29 – 33. Number of steps in solutions may vary.

29.  $n \cdot 8 = 8 \div 4 \cdot 16$

$n \cdot 8 = 2 \cdot 16$

$$\frac{8n}{8} = \frac{32}{8}$$

$n = 4$

30.  $6n - 2 = 11 \cdot 2$

$6n - 2 = 22$

$$\begin{array}{r} +2 \quad +2 \\ \hline 6n = 24 \\ \hline \frac{6n}{6} = \frac{24}{6} \end{array}$$

$n = 4$

31.  $7x + 21 = 5 + 51$

$7x + 21 = 56$

$$\begin{array}{r} -21 = -21 \\ \hline 7x = 35 \\ \hline \frac{7x}{7} = \frac{35}{7} \end{array}$$

$x = 5$

32.  $13 \cdot 3 = 12n + 15$

$39 = 12n + 15$

$$\begin{array}{r} -15 \quad -15 \\ \hline 24 = 12n \\ \hline \frac{24}{12} = \frac{12n}{12} \end{array}$$

$2 = n$

33.  $\frac{8n}{8} = \frac{7}{8}$

$n = \frac{7}{8}$

34. 1

35. 10

36. 10,000

37.  $10^{-4}$

38.  $10^6$

39.  $\frac{1}{9}$

40.  $\frac{1}{125}$

41.  $0.\overline{3}$

42.  $0.8\overline{3}$

43. 0.125

44. 0.625

45.  $66\frac{2}{3}\%$

46.  $16\frac{2}{3}\%$

47.  $37\frac{1}{2}\%$

48.  $87\frac{1}{2}\%$

49. 109

50. 157

51. 53

52. 134

53. 114

54. \$2,200

55. 4.75%; 0.0475

56. 0.6%; 0.006

57. 22

58. \$16.88

59. 127

60. 13

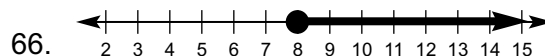
61. \$437.50

62. \$3,937.50

63. \$75

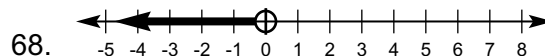
64. \$2,075

65.  $x \geq 8$



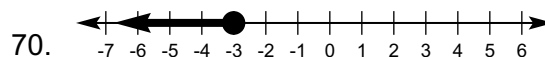
66.

67.  $x < 0$



68.

69.  $x \leq -3$



70.

71, 72. Number of steps in solutions may vary.

71.  $28 \text{ cm}^2$      $A = bh$   
 $A = 7 \times 4$   
 $A = 28$

72.  $121.5 \text{ m}^2$      $A = \frac{1}{2}(b_1 + b_2)h$   
 $A = \frac{1}{2}(16 + 11)9$   
 $A = \frac{1}{2}(27)9$   
 $A = 121.5$

$$73. \quad 160 \text{ in}^2 \quad A = \frac{1}{2}(bh) \quad A = lw$$

$$A = \frac{1}{2}(8 \times 4) \quad A = 16 \times 8$$

$$A = 16 \quad A = 128$$

$$16 \times 2 = 32 \quad 128 + 32 = 160$$

$$83. \quad 5 \text{ m} \quad P = 2l + 2w$$

$$28 = 2 \times 9 + 2w$$

$$28 = 18 + 2w$$

$$\underline{-18} \quad \underline{-18}$$

$$\frac{10}{2} = \frac{2w}{2}$$

$$5 = w$$

74 – 76. Number of steps in solutions may vary.

$$74. \quad 100 \text{ mi}^2 \quad A = lw \quad A = lw$$

$$A = 14 \times 8 \quad A = 6 \times 2$$

$$A = 112 \quad A = 12$$

$$112 - 12 = 100$$

$$84. \quad 6.5 \text{ cm} \quad C = \pi d$$

$$\frac{20.41}{3.14} = \frac{3.14 \times d}{3.14}$$

$$6.5 = d$$

$$75. \quad 60 \text{ cm}^3 \quad V = Bh$$

$$V = (\frac{1}{2}bh)h$$

$$V = (\frac{1}{2} \times 4 \times 3)10$$

$$V = 60$$

$$85. \quad 6 \text{ ft} \quad V = lwh$$

$$72 = l \times 3 \times 4$$

$$\frac{72}{12} = \frac{l \times 12}{12}$$

$$6 = l$$

$$76. \quad 1,004.8 \text{ ft}^3 \quad V = Bh$$

$$V = (\pi r^2)h$$

$$V = (3.14 \times 4 \times 4)20$$

$$V = 50.24 \times 20$$

$$V = 1,004.8$$

$$86. \quad 2 \text{ cm} \quad V = Bh$$

$$\frac{12}{6} = \frac{6 \times h}{6}$$

$$2 = h$$

$$77. \quad 2 \cdot 2 \cdot 3 \cdot 3$$

$$78. \quad 2 \cdot 3 \cdot 3 \cdot 5$$

$$79. \quad 18$$

$$80. \quad 5^4$$

$$81. \quad 3^2 \cdot 5^2$$

$$87. \quad 50 \quad \begin{array}{r} 80 \\ + 50 \\ \hline 130 \end{array} \quad \begin{array}{r} 180 \\ - 130 \\ \hline 50 \end{array}$$

$$82. \quad 7 \text{ cm} \quad A = lw$$

$$\frac{28}{4} = \frac{l \times 4}{4}$$

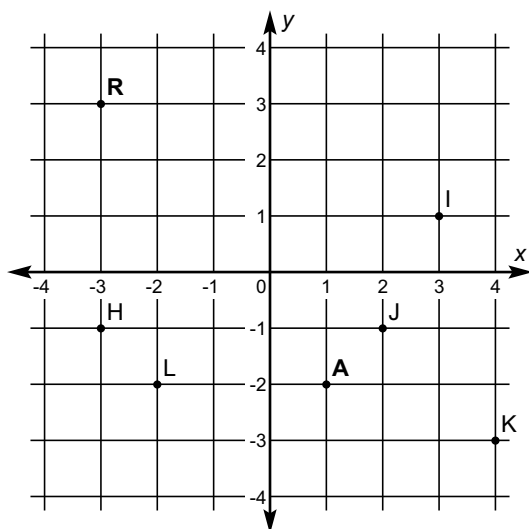
$$7 = l$$

# Answers for Level 800

## Sunrise Edition

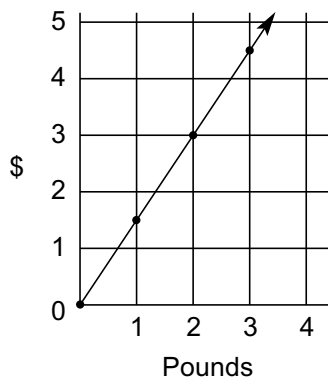
1.  $-15n - 10$
2.  $42n + 28$
3.  $-3$
4.  $10$
5.  $(-2, -2)$
6.  $(4, -3)$
7. J
8. H

9, 10.



11.  $-2b + 7d + 3$
12.  $5x - 3y + 6$
13.  $-9x - y - 9$
14.  $-6x + 9y - 9$
15.  $4x^3 - 6x^2 + 10$
16.  $7y^2 + y^2 + y$
17.
 

Pounds	\$
1	\$1.50
2	\$3.00
3	\$4.50



18. See points and linear relation on graph

19.  $18a^4b$

20.  $4y^9$

21.  $y^2 = 21$

$$\sqrt{y^2} = \sqrt{21}$$

$$y = \sqrt{21}$$

22.  $x^2 = 9$

$$\sqrt{x^2} = \sqrt{9}$$

$$x = 3$$

23.  $x^2 - 18 = 18$

$$\begin{array}{r} +18 +18 \\ \hline \end{array}$$

$$x^2 = 36$$

$$\sqrt{x^2} = \sqrt{36}$$

$$x = 6$$

24.  $4\{[18 \div (2 + 1) + 6] - 12\}$

$$4\{[18 \div 3 + 6] - 12\}$$

$$4\{[6 + 6] - 12\}$$

$$4\{12 - 12\}$$

$$4 \cdot 0$$

$$0$$

25.  $\{[4 + (6 \cdot 3) + 2] \div 4 + 2\}2$

$$\{[4 + 18 + 2] \div 4 + 2\}2$$

$$\{[22 + 2] \div 4 + 2\}2$$

$$\{24 \div 4 + 2\}2$$

$$\{6 + 2\}2$$

$$8 \cdot 2$$

$$16$$

26.  $\frac{8x^2}{4y^3} = \frac{\overset{2}{\cancel{8}} \cdot x \cdot x}{\underset{1}{\cancel{4}} \cdot y \cdot y \cdot y} = \frac{2x^2}{y^3}$

27.  $\frac{14x^3y}{7x^2} = \frac{\overset{2}{\cancel{14}} \cdot \overset{1}{\cancel{x}} \cdot \overset{1}{\cancel{x}} \cdot \overset{1}{\cancel{x}} \cdot y}{\underset{1}{\cancel{7}} \cdot \underset{1}{\cancel{x}} \cdot \underset{1}{\cancel{x}}} = \frac{2xy}{1} = 2xy$

28.  $y^4$

29.  $x^3$

30.  $t^{-4}$

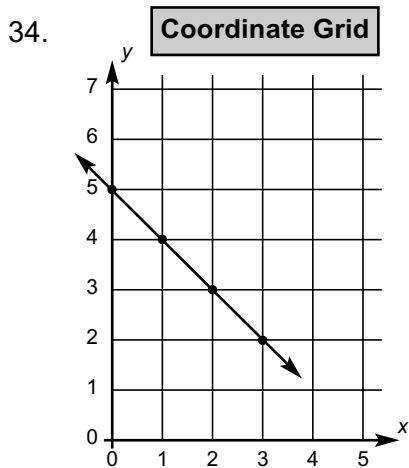
31.  $s^{-2}$

32. **Table of Values**

x	y
0	5
1	4
2	3
3	2

33. **Coordinates**

(0, 5)
(1, 4)
(2, 3)
(3, 2)



$$\begin{array}{r}
 5 = x + y \\
 5 = 0 + y \\
 \underline{-0 \quad -0} \\
 5 = y
 \end{array}
 \qquad
 \begin{array}{r}
 5 = x + y \\
 5 = 1 + y \\
 \underline{-1 \quad -1} \\
 4 = y
 \end{array}$$
  

$$\begin{array}{r}
 5 = x + y \\
 5 = 2 + y \\
 \underline{-2 \quad -2} \\
 3 = y
 \end{array}
 \qquad
 \begin{array}{r}
 5 = x + y \\
 5 = 3 + y \\
 \underline{-3 \quad -3} \\
 2 = y
 \end{array}$$

35.  $\frac{9 - 2 \cdot 3 + 4}{7 \cdot 3 + 6} = \frac{9 - 6 + 4}{21 + 6} = \frac{3 + 4}{27} = \frac{7}{27}$

36.  $\frac{3 + 5 \cdot 3}{6 \cdot 2 \cdot 3} = \frac{3 + 15}{12 \cdot 3} = \frac{18}{36} = \frac{1}{2}$

37.  $\frac{1}{4}x = 12$   
 $\frac{4}{1} \cdot \frac{1}{4} = 12 \cdot \frac{1}{4}$   
 $x = 48$

38.  $\frac{1}{3}x = 15$   
 $\frac{3}{1} \cdot \frac{1}{3} = 15 \cdot \frac{1}{3}$   
 $x = 45$

39. 3 in

$$\begin{aligned}
 A &= \frac{1}{2}(b_1 + b_2)h \\
 16.5 &= \frac{1}{2}(5 + 6)h \\
 \frac{2}{1} \cdot 16.5 &= \frac{2}{1} \cdot \frac{1}{2}(11)h \\
 \frac{33}{1} &= \frac{11 \cdot h}{1} \\
 3 &= h
 \end{aligned}$$

40.  $\frac{-8a}{-8} = \frac{24}{-8}$   
 $a = -3$

41.  $\frac{-3x}{-3} = \frac{16}{-3}$   
 $x = -5\frac{1}{3}$

42.  $\frac{-n}{-1} = \frac{10}{-1}$   
 $n = -10$

43. \$56.25  
 $i = prt$   
 $i = 4,500 \times 0.05 \times 0.25 = 56.25$

44. \$4,556.25  
 $\$4,500 + 56.25 = \$4,556.25$

45. \$20.83  
 $i = prt$   
 $i = 625 \times 0.05 \times \frac{2}{3} = 20.8\bar{3} = 20.83$

46. \$645.83  
 $\$625 + 20.83 = \$645.83$

47. \$0.124

48. \$1.233

49. 49.1 cents

50. 31.9 cents

51. LCM = 150  
 $5^2; 2 \cdot 3 \cdot 5; 2 \cdot 3 \cdot 5^2$

52. LCM = 108  
 $3^2; 2^2 \cdot 3^2; 2 \cdot 3^3; 2^2 \cdot 3^3$

Level 800

53.  $803.84 \text{ ft}^2$  Solutions may vary.

$$\begin{aligned}
 A &= \pi r^2 \\
 A &= 3.14 \times 12 \times 12 \\
 A &= 3.14 \times 144 \\
 A &= 452.16 \\
 A &= \pi r^2 \\
 A &= 3.14 \times 20 \times 20 & 1256.00 \\
 A &= 3.14 \times 400 & -452.16 \\
 \hline
 A &= 1,256 & 803.84
 \end{aligned}$$

54.  $50\frac{3}{4} \text{ in}^2$

$$\begin{aligned}
 A &= lw & A &= \pi r^2 \\
 A &= 7 \times 10 & A &= \frac{22}{7} \times 3\frac{1}{2} \times 3\frac{1}{2} \\
 A &= 70 & A &= \frac{11}{7} \times \frac{1}{2} \times \frac{7}{1} \times \frac{7}{2} \\
 & & A &= \frac{77}{2} = 38\frac{1}{2}
 \end{aligned}$$

$$38\frac{1}{2} \div 2 = \frac{77}{2} \times \frac{1}{2} = \frac{77}{4} = 19\frac{1}{4} \quad \frac{60}{70\frac{4}{4}}$$

55.  $\perp$

56.  $\parallel$

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

$$9^2 + 21^2 = c^2$$

$$81 + 441 = c^2$$

$$522 = c^2$$

$$\sqrt{522} = \sqrt{c^2}$$

$$22.8 \approx c$$

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

$$a^2 + 16^2 = 22^2$$

$$a^2 + 256 = 484$$

$$\underline{-256} \quad \underline{-256}$$

$$a^2 = 228$$

$$\sqrt{a^2} = \sqrt{228}$$

$$a \approx 15.1$$

59.  $x + 2 = y$

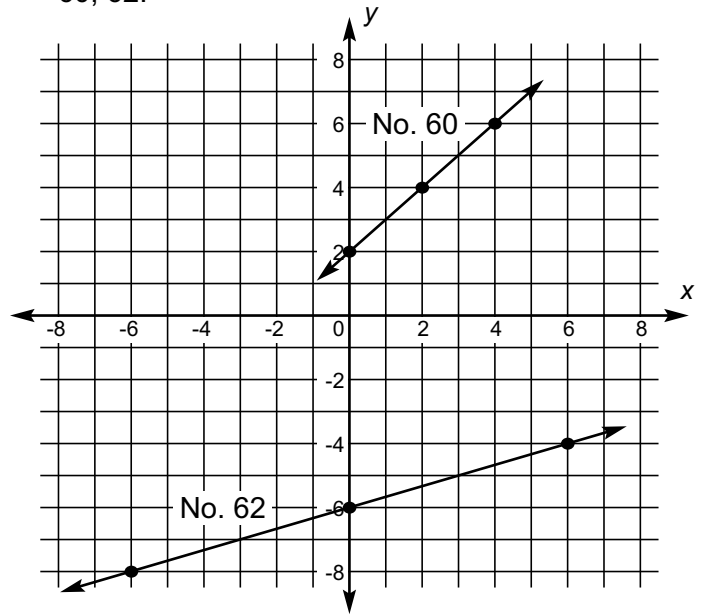
$$0 + 2 = 2$$

$$2 + 2 = 4$$

$$4 + 2 = 6$$

x	y
0	2
2	4
4	6

60, 62.



61.  $\frac{x}{3} - 6 = y$

$$0 \div 3 - 6 = -6$$

$$6 \div 3 - 6 = -4$$

$$-6 \div 3 - 6 = -8$$

x	y
0	-6
6	-4
-6	-8

63.  $135 \text{ m}^3$

$$V = \frac{1}{3}Bh$$

$$V = \frac{1}{3}(s^2)h$$

$$V = \frac{1}{3}(9 \times 9)5$$

$$V = \frac{1}{3} \times (81)5$$

$$V = \frac{1}{3} \times 405$$

$$V = 135$$

64.  $50.24 \text{ ft}^3$

$$V = \frac{1}{3}Bh$$

$$V = \frac{1}{3}(\pi r^2)h$$

$$V = \frac{1}{3}(3.14 \times 2 \times 2)12$$

$$V = \frac{1}{3} \times 12.56 \times 12$$

$$V = 50.24$$

65.  $4.5 \approx c$

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

$$4^2 + 2^2 = c^2$$

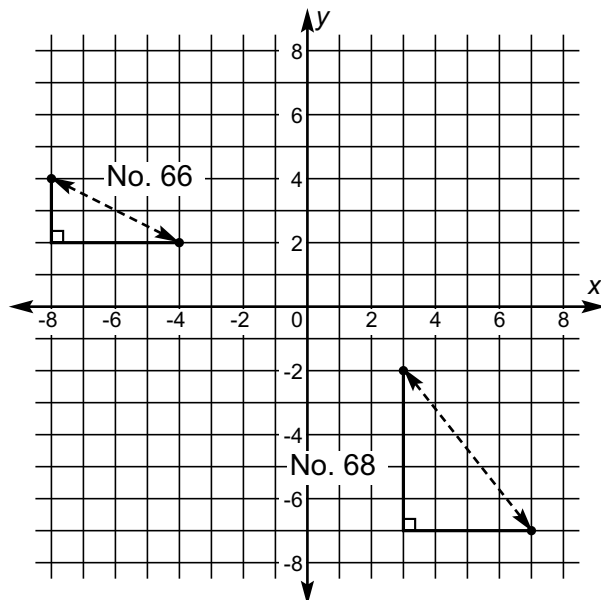
$$16 + 4 = c^2$$

$$20 = c^2$$

$$\sqrt{20} = \sqrt{c^2}$$

$$4.5 \approx c$$

66, 68.



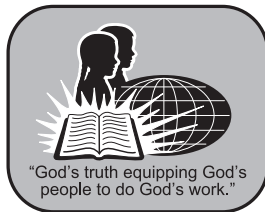
67.  $6.4 \approx c$   
 $a^2 + b^2 = c^2$   
 $4^2 + 5^2 = c^2$   
 $16 + 25 = c^2$   
 $41 = c^2$   
 $\sqrt{41} = \sqrt{c^2}$   
 $6.4 \approx c$

- 69. irrational
- 70. rational
- 71. rational
- 72. rational
- 73. rational
- 74. irrational

- 75. 34,200
  - 76. 0.00000509
  - 77.  $4.37 \times 10^6$
  - 78.  $2.4 \times 10^{-3}$
  - 79.  $2.4 \times 10^8$        $(0.4 \times 6)(10^3 \times 10^5)$
  - 80.  $4.2 \times 10^{-9}$        $(1.4 \times 3)(10^{-3} \times 10^{-6})$
  - 81.  $2.1 \times 10^1$        $(\frac{6.3}{3})(\frac{10^3}{10^2})$
  - 82.  $5.1 \times 10^9$        $(\frac{10.2}{2})(\frac{10^4}{10^{-5}})$
  - 83.  $15 \times 10^{-2} = (1.5 \times 10^1)(10^{-2}) = 1.5 \times 10^{-1}$
  - 84.  $24.5 \times 10^{16} =$   
 $(2.45 \times 10^1)(10^{16}) = 2.45 \times 10^{17}$
  - 85.  $0.8 \times 10^{-5} = (8 \times 10^{-1})(10^{-5}) = 8 \times 10^{-6}$
  - 86.  $0.9 \times 10^9 = (9 \times 10^{-1})(10^9) = 9 \times 10^8$
  - 87.  $0.11\bar{6}$ ; 0.117
  - 88. 0.03375; 0.034
  - 89. 11.41      90. 1.656
- |             |               |
|-------------|---------------|
| 0.163       | 0.06625       |
| $\times 70$ | $\times 25$   |
| 11.410      | 33125         |
|             | <u>132500</u> |
|             | 1.65625       |







**CLE**



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