

**Math 9 Review
Answer Section**

COMPLETION

1. 60°
2. 15°
3. Example: $\frac{3}{4}$
 $\frac{3}{4}$
 $\frac{3}{4}$
4. multiplication
 what is in brackets
 3.7×8.2
5. -3.8
6. $\frac{9}{7}$
 $1\frac{2}{7}$
 $9/7$
 $1\frac{2}{7}$
7. $\frac{3}{4}$ m
 $3/4$ m
8. 1
 one
9. 5^8
10. $12^3 = 1728 \text{ cm}^3$
11. 7^0
12. 81
13. 3^5
14. angles
15. scale factor
16. scale
17. similar polygons
18. regular polygon
19. $\frac{1}{3}$ or $33.\bar{3}\%$
 $1/3$
 $33.\bar{3}\%$
20. $-4y^2 + 7y$
21. $2p^2 - 6p - 1$

22. $3r^2 - 2r + 2$
23. $5w^2 + w - 5$
24. $a^2 - 3a - 1$
25. $5n + 7$
26. $3k^2 - 8k + 3$
27. $y = -x + 4$
28. 32
29. 74-75 kPa
30. vertical
31. horizontal
32. $x - 2$
33. $\frac{6x^2}{-3x} = -2x$
34. $4y$
35. $2r^2 + 1$
36. $18r^2 + 6r$
37. distributive property
38. $\frac{1}{7}(p + 9)$ or $(p + 9) \div 7$
39. numerator
40. denominator
41. $h = 2.5$
42. $p = \frac{7}{5}$ or $1\frac{2}{5}$.
43. $6 \times \frac{p-9}{3} = 6 \times \frac{3}{2}$
44. $x \geq -4$
45. $y < 4$
46. $a \leq -4.5$
47. $x > 4$
48. chord
49. central angle
50. inscribed angle
51. perpendicular bisector
52. arc
53. point of tangency
54. cultural sensitivity
55. convenience
56. predictions
generalizations
57. $\frac{\text{number of successful outcomes}}{\text{number of possible outcomes}}$
number of successful outcomes/number of possible outcomes

58. experimental, theoretical

59. $x > \frac{2}{5}$

SHORT ANSWER

60.

a) $\frac{5}{14} < 0.4$

c) $0.\bar{6} = 0.\bar{3} + \frac{1}{3}$

b) $2\frac{4}{7} > 2\frac{3}{8}$

d) $\frac{49}{50} - \frac{7}{10} = \frac{1}{5} + \frac{2}{25}$

61. Area of circle $= \pi r^2$
 $= \pi(5.7)^2$
 $= 102.070345$
 ≈ 102.07

Side length of square $= \sqrt{102.07}$
 ≈ 10.1

The square is approximately 10.1 cm by 10.1 cm.

62. cost of airfare + cost of taxi + 3(cost of hotel night) $= 256.80 + 2 \times 15.00 + 3 \times 87.20$
 $= 256.80 + 30.00 + 261.60$
 $= 548.40$

Tia spends a total of \$548.40 on her trip.

63. a) Example: Step 1: Divide the whole, large pizza by 2.

Step 2: Multiply this number by $\frac{7}{10}$ to determine how much pizza Joe ate.

Step 3: Multiply the result of step 1 by $\frac{7}{8}$ to determine how much Hakim ate.

b) Joe: $(1 \div 2) \times \frac{7}{10}$

Hakim: $(1 \div 2) \times \frac{7}{8}$

$$= \frac{1}{2} \times \frac{7}{10}$$

$$= \frac{1}{2} \times \frac{7}{8}$$

$$= \frac{7}{20}$$

$$= \frac{7}{16}$$

Joe ate $\frac{7}{20}$ of the whole pizza. Hakim ate $\frac{7}{16}$ of the whole pizza.

64. Example:

a) $100 = 2^2 \times 5^2$

b) $108 = 2^2 \times 3^3$

c) $72 = 2^3 \times 3^2$

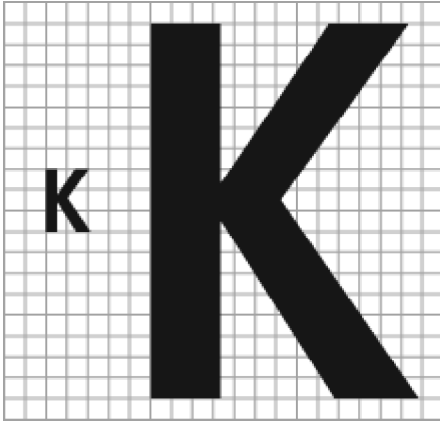
d) $2500 = 10^2 \times 5^2$

65.

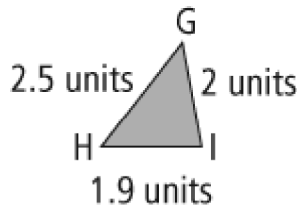
a) 1 c) -17.6

b) 120.4 d) 8.7

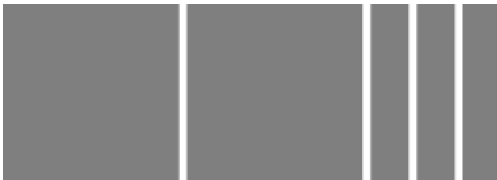
66. a) $6^2 + 7^2 = 85 \text{ cm}^2$
 b) $4^2 + 9^2 = 97 \text{ cm}^2$
 c) $8^2 + 11^2 = 185 \text{ cm}^2$



67.
 68. Multiply each side of $\triangle KLM$ by 0.25.
 $8 \times 0.25 = 2 \text{ units}$
 $7.6 \times 0.25 = 1.9 \text{ units}$
 $10 \times 0.25 = 2.5 \text{ units}$
 Draw a triangle with the corresponding side lengths.



69. $2c^2 + 3c$



70. a) She was 5 m from the sensor when she began walking.
 b) She was walking toward the motion sensor.
 c) It took her 10 s to reach the motion sensor.

71. $SA = 2(2a \times a) + 2(3a \times a) + 2(2a \times 3a)$
 $= 4a^2 + 6a^2 + 12a^2$
 $= 22a^2$

The surface area of the rectangular prism is $22a^2$.

72. The volume of the rectangular prism is $(x)(2x)(4x) = 8x^3$.
 A cube has an equal length, width, and height.
 Therefore, the edge length of the cube is $2x$.

73. Let x represent the number of hours worked.

$$P = 5(25x + 100) + 12(10x + 60)$$

$$P = 125x + 500 + 120x + 720$$

$$P = 245x + 1220$$

The algebraic expression that represents the payroll that week is $P = 245x + 1220$.

74. Example:

$$\text{Pop sold} = 288.00 \div 0.90$$

$$= 320 \text{ cans}$$

$$\text{Bags of chips sold} = \frac{3}{4} \times 320$$

$$= 240$$

$$\text{Value of chips sold} = 240 \times 0.60$$

$$= \$144.00$$

The student council sold \$144.00 worth of chips.

75. $4(4.1c - 0.875) = 6(1.8c + 1.75)$

$$16.4c - 3.5 = 10.8c + 10.5$$

$$16.4c - 10.8c = 10.5 + 3.5$$

$$5.6c = 14.0$$

$$c = 2.5$$

76. Example:

The solution is all values greater than or equal to -3 but less than 8 .

$$-3 \leq x < 8 \text{ or } x \geq -3 \text{ and } x < 8$$

77. $(2x + 1) + (2x + 3) + (2x - 2) \geq 44$

$$6x + 2 \geq 44$$

$$6x \geq 42$$

$$x \geq 7$$

The value of x can be greater than or equal to 7 .

78. Radius CM is 35 mm.

Line CP is 21 mm.

$$MN = 2MP$$

$$= 2\sqrt{35^2 - 21^2}$$

$$= 2\sqrt{1225 - 441}$$

$$= 2\sqrt{784}$$

$$= 2(28)$$

$$= 56 \text{ mm}$$

The length of chord MN is 56 mm.

$$79. \quad AD = \frac{AB}{2}$$

$$= \frac{120}{2}$$

$$= 60 \text{ mm}$$

$\triangle ACD$ is a right triangle (CD is a radius to a tangent).

$$CD = \sqrt{CB^2 - DB^2}$$

$$= \sqrt{75^2 - 60^2}$$

$$= \sqrt{5625 - 3600}$$

$$= \sqrt{2025}$$

$$= 45 \text{ mm}$$

Diameter: $2 \times 45 = 90 \text{ mm}$

The diameter of the circle is 90 mm.

80. Example:

- How many movies have you gone to in the last 12 months?
- On average, how many movies do you go to per month?

81. Example:

a) The population would be all of the computer chips manufactured. A systematic sample can be used by picking and testing every 1000th chip manufactured.

b) The population would be all of the tax-paying citizens in Canada. A random sample can be used by creating a computer program that randomly selects individuals from a database of Social Insurance Numbers of people who paid tax the previous year.

c) The population would be all of the people who listen to the station. A voluntary response sample can be used by asking listeners to log onto the radio's Website and answer a survey question about their age.

82. Example: Theoretical probability is calculated as the number of successful outcomes divided by the number of possible outcomes. The theoretical probability of an event does not change.

Experimental probability is calculated as a ratio of the number of successful trials divided by the total number of trials. The number of successful trials is based on the results of an experiment, and can change each time you repeat the experiment.

PROBLEM83. Length of roof = l

$$l^2 = 4.1^2 + 4^2$$

$$l^2 = 16.81 + 16$$

$$l^2 = 32.81$$

$$l = 5.7$$

Size of tile:

$$20 \text{ cm} = 0.2 \text{ m}$$

$$30 \text{ cm} = 0.3 \text{ m}$$

$$\text{Area of a tile: } 0.2 \times 0.3 = 0.06 \text{ m}^2$$

$$\text{Area of slanted faces: } 2 \times 14 \times 5.7 = 159.6 \text{ m}^2$$

$$\text{Number of tiles needed to cover roof: } 159.6 \div 0.06 = 2660 \text{ tiles}$$

You would need 2660 tiles to cover the slanted faces of the roof.

$$\begin{aligned} 84. \text{ a) Monday's stock value} &= 120 \times \$34.16 \\ &= \$4099.20 \end{aligned}$$

$$\text{Friday's stock value} = \$4468.80$$

$$\text{Change} = +\$369.60$$

Pak gained \$369.60 by selling on Friday.

$$\begin{aligned} \text{b) Value of stock on Friday} &= \text{Total sale value on Friday} \div \text{number of stocks} \\ &= 4468.80 \div 120 \\ &= 37.24 \end{aligned}$$

The value of each share on Friday was \$37.24.

85. Example:

$$\text{Surface area of sphere : } SA = \frac{\pi(7)^2}{3}$$

$$SA = \frac{49\pi}{3}$$

$$SA = 51.31268$$

$$SA \approx 51.31$$

Surface area of the cube : $6x^2$, where x is the side length of the cube

$$6x^2 = 51.31$$

$$x^2 \approx 8.55$$

$$x \approx 2.92$$

The side lengths of the cube are approximately 2.9 cm.

86. For 1 person in 1 day: 2 cups tea

$$1.5(2) = 3 \text{ cups juice}$$

$$0.75(2) = 1.5 \text{ cups milk}$$

$$\text{Cost for 1 person in 1 day: } 2(0.10) + 3(0.22) + 1.5(0.16)$$

$$= 0.20 + 0.66 + 0.24$$

$$= \$1.10$$

$$\text{Cost for 425 people in 1 day: } 425(1.10)$$

$$= \$467.50$$

$$\text{Cost for 425 people in 1 week: } 7(467.50)$$

$$= \$3272.50$$

The total cost of beverages for the 1 week at the resort is \$3272.50.

87. Example:

$$\mathbf{a)} \ 3^4 - (3^1 \times 3^1 \times 3^2)$$

$$\mathbf{b)} \ 3^4 - (3^1 \times 3^1 \times 3^1 \times 3^1)$$

$$\mathbf{c)} \ 3^5 - (3^1 \times 3^1 \times 3^1 \times 3^1 \times 3^1)$$

88. Let
- P
- represent the population of insects.

$$P = 1000(2)^{-2}$$

$$P = 1000(0.25)$$

$$P = 250$$

There were 250 insects in the colony two months ago.

Check:

$$P = 250(2)^2$$

$$P = 250(4)$$

$$P = 1000$$

The answer is correct.

- 89.
- a)**
- $4^{3x} = (4^x)^3$

$$= 7^3$$

$$= 343$$

$$\mathbf{b)} \ 4^{(x+2)} = (4^x) \times 4^2$$

$$= 7 \times 16$$

$$= 112$$

- 90.
- a)**
- The first number can be represented as
- 1^1
- , the second as
- 2^2
- , the third as
- 3^3
- , and the fourth as
- 4^4
- . Therefore, the pattern is consecutive numbers for the base and the same consecutive number for the exponent.

$$\mathbf{b)} \ 5^5 = 3125$$

$$8^8 = 16\,777\,200$$

The fifth number in the series is 3125, and the eighth number is 16 777 200.

91. Distance between Point A and Point C on the map = $\sqrt{AB^2 + BC^2}$
 $= \sqrt{4.5^2 + 6.0^2}$
 $= \sqrt{20.25 + 36}$
 $= \sqrt{56.25}$
 $= 7.5$

Scale of the map = 1 cm:75 km
 Distance on map $\times 15 =$ actual distance

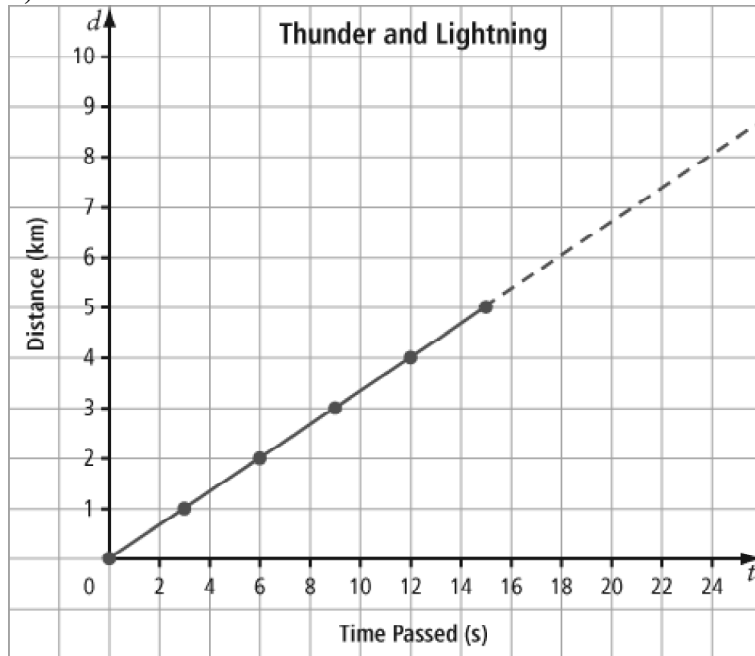
$$7.5 \times 15 = 112.5 \text{ km}$$

The actual distance between Point A and Point C is 112.5 km.

92. a)

Distance, d (km)	Time, t (s)
0	0
1	3
2	6
3	9
4	12
5	15

b)



c) Interpolating from the graph, the time is approximately 1.5 s.

d) Extrapolating from the graph, the distance is approximately 19 km.

93. a) $SA = 2(5 \times y) + 2(5 \times 3y) + 2(y \times 3y)$

$$SA = 10y + 30y + 6y^2$$

$$SA = 6y^2 + 40y$$

The expanded expression for the surface area of the package is $6y^2 + 40y$ cm².

b) $V = (5)(y)(3y)$

$$V = 15y^2$$

The expanded expression for the volume of the package is $15y^2$ cm³.

c) $SA = 6y^2 + 40y$

$$SA = 6(3)^2 + 40(3)$$

$$SA = 54 + 120$$

$$= 174$$

The surface area of the package is 174 cm².

$$V = 15y^2$$

$$V = 15(3)^2$$

$$V = 135$$

The volume of the package is 135 cm³.

94. Radius of circle is $\frac{x}{2}$.

$$A_{circle} = \pi \left(\frac{x}{2} \right)^2$$

$$A = \frac{\pi x^2}{4}$$

$$\text{Area of rectangle} = x(2x)$$

$$A = 2x^2$$

$$\frac{\text{Area of Rectangle}}{\text{Area of Circle}} = \frac{2x^2}{\frac{\pi x^2}{4}}$$

$$= 2x^2 \left(\frac{4}{\pi x^2} \right)$$

$$= \frac{8}{\pi}$$

The ratio of the area of the rectangle to the area of the circle is $\frac{8}{\pi}$.

95. Let c represent the annual rainfall of Calgary.

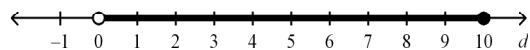
$$415.6 = 9 + 1\frac{1}{3}c$$

$$406.6 = 1\frac{1}{3}c$$

$$304.95 = c$$

The annual rainfall of Calgary is 304.95 mm.

96. a)



b) Example: The graph starts at 0 with an open circle because the degu must survive its birth in order to be a pet. It ends with a closed circle which represents the maximum lifespan of 10 years.

97. Let p be the number of gallons of paint used.

$$5\frac{1}{2} - p > 1\frac{3}{4}$$

$$\frac{11}{2} - p > \frac{7}{4}$$

$$-p > \frac{7}{4} - \frac{11}{2}$$

$$-p > \frac{7}{4} - \frac{22}{4}$$

$$-p > -\frac{15}{4}$$

$$p < \frac{15}{4}$$

$$p < 3\frac{3}{4}$$

Ryan used less than $3\frac{3}{4}$ gallons of paint.

- 98.
- a) The population is all the students attending Statsville High School.
 - b) Example: I would create a systematic sample by dividing the school into grades and randomly selecting the same proportion of people from each grade.
 - c) Example: I would ask homeroom teachers to randomly select 15% of their class and ask those students to complete the survey.
 - d) Example: The data could be presented by grade level using circle graphs with a summary circle graph with all grades combined.
 - e) Example: I would review the grade-level responses to look for significant differences between grades. I would then compare the grade-level responses to the school-wide summary.
 - f) Example: I would present a written report to the administration that included a copy of the survey, the sampling procedure, a note about any sampling issues, graphs for each grade level and school wide results, and a conclusion that answers the survey question.
99. $0.45 \times 24 = 10.8$
The rabbit sleeps 10.8 h a day.
100. a) Let s represent the speed of the ski jumper. Since she begins at zero and reaches a maximum speed of 27.6 m/s, $0 \leq s \leq 27.6$ or $s \leq 27.6$ and $s \geq 0$.

b)

