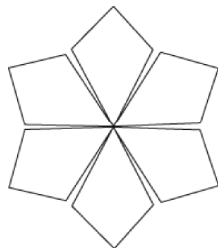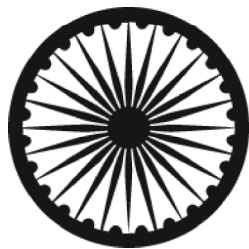**Math 9 Review**

1. The measurement of the angle of rotation for the figure is _____.

2. The measurement of the angle of rotation for the figure is _____.

3. A fraction between the rational numbers 0.7 and 0.8 is _____.

4. When evaluating the expression $-4.2 + (3.7 \times 8.2)$, the first step is _____.

5. $\square \times (-4.2) = 15.96$

   The missing value in the statement is _____.

6. The statement $\left(\dfrac{4}{7} \div \dfrac{4}{9} \right)$ is equal to _____.

7. The side length of a square with an area of $\dfrac{9}{16}$ m² is _____.

8. Any base raised to the exponent of zero equals _____.

9. The power $\left(5^2 \right)^4$, when written as a single exponent, is equal to _____.

10. The volume of a cube with side lengths of 12 cm is _____.

11. The power $\left(7^8 \right)^0$, when written as a single exponent, is equal to _____.

12. $(9+3)^2 - \left(6^2 + 3^3 \right)$ equals _____.

13. 243 expressed as a power with base 3 is _____.

14. Similar triangles have different sizes, but equal _____.

15. The enlargement of an image is 3 times the size of the original. The value 3 represents the _____.

16. A comparison between the actual size of an object and the size of its diagram is the

   _____.

17. Figures that have 3 or more equal corresponding angles and 3 or more proportional corresponding sides are _____.

18. A figures that has all sides and all angles equal is a

   _____.

19. A scale factor of _____
   was used to create the letter on the left from the letter on the right.
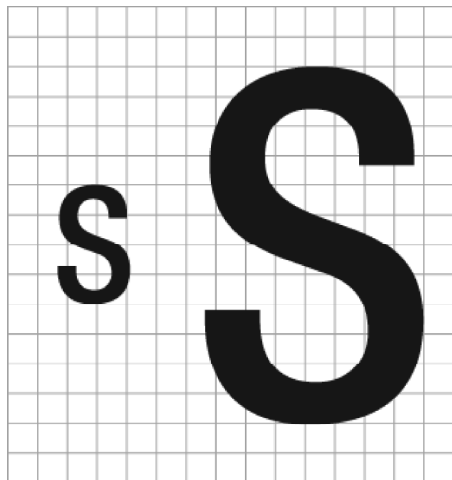
20. Simplify the following by combining like terms.
   $4y - 3y^2 + y - 3y^2 + 2y^2 + 2y$

21. Simplify the following by combining like terms.
   $-5 - 3p^2 - 4p + 4 + 5p^2 - 2p$

22. Simplify the following by combining like terms.
   $3r - 5r^2 - 3 + 6r^2 - 5r + 3 + 2r^2 + 2$

23. Simplify the following by combining like terms.
   $2w^2 - 2w + 4 + 3w^2 + 3w - 9$

24. Add the following polynomials.
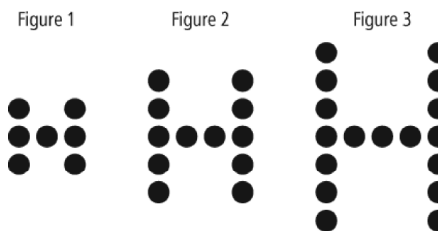 $(4a^2 - 5a + 2) + (-3a^2 + 2a - 3)$

25. Subtract the following polynomials.
   $(2n + 5) - (-3n - 2)$

26. Add and simplify by combining like terms.
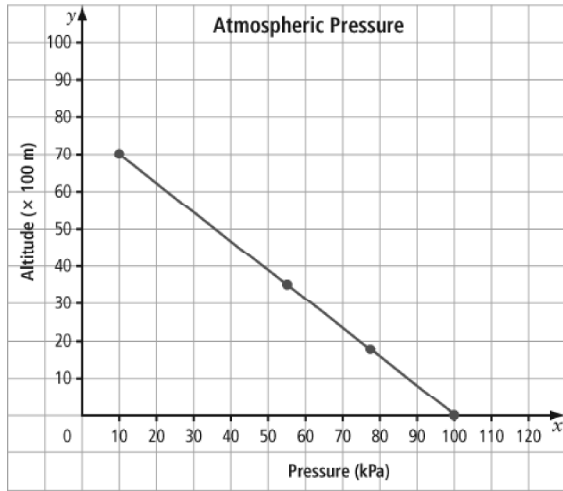 $(6k^2 - 3k + 6) + (-3k^2 - 5k - 3)$

27. The linear equation that represents this table of values is _____.

x	y
0	4
1	3
2	2
4	0

28. The number of dots in the 6th figure of this pattern is _____.

| Figure 1 | Figure 2 | Figure 3 |

Assume that this graph shows air pressure at different altitudes. Use the graph to answer the following question(s).

Atmospheric Pressure

Altitude (× 100 m) vs Pressure (kPa)

29. According to the graph, the approximate air pressure at an altitude of 2000 m is
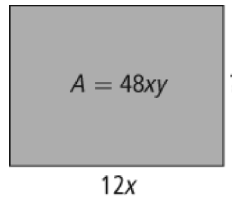_____.

30. The equation $x = 4$ represents a
_____ line.

31. The equation $y = 7$ represents a
_____ line.

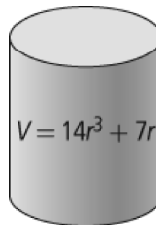32. The quotient of $\left(-5x^2 + 10x\right)$ and $-5x$ is
_____.

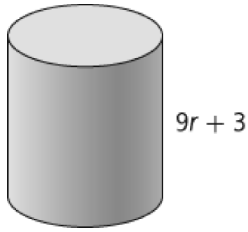33. The division statement modelled by the algebra tiles shown below is
_____.

34. The missing dimension in the diagram shown is
_____.

$A = 48xy$?

$12x$

35.
The base of the cylinder has an area of $7r$ square units. The height of the cylinder is
_____.

$V = 14r^3 + 7r$

36. The base of the cylinder has an area of $2r$ square units. The volume of the cylinder is

_____.

$9r + 3$
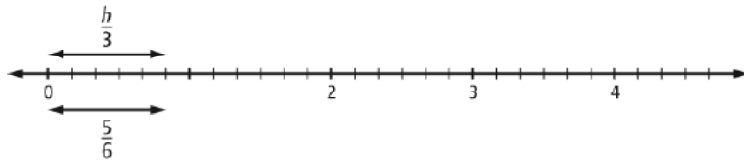
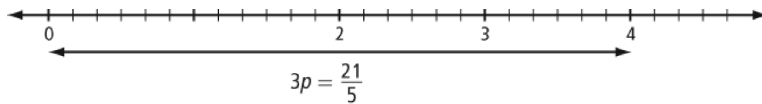37. Brandon started to solve the equation below as follows:

$3y(y - 2) = 9$

$3y^2 - 6y = 9$

Brandon used the _____.

38. Another way to write $\dfrac{p + 9}{7}$ is

_____.

39. The top number of a fraction is called the

_____.

40. In the equation $\dfrac{3z - 4}{5} = 1$, the 5 is the

_____.

41. Using the number line and the equation $\dfrac{h}{3} = \dfrac{5}{6}$, the value of h is _____.

$\dfrac{h}{3}$

0   2   3   4

$\dfrac{5}{6}$

42. Using the number line below and the equation $3p = \dfrac{21}{5}$, the value of p is _____.

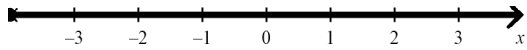0   2   3   4

$3p = \dfrac{21}{5}$

43. Sarina was simplifying $\dfrac{p-9}{3} = \dfrac{3}{2}$.

She wrote $\quad \dfrac{p-9}{3} = \dfrac{3}{2}$

$$3 \times \dfrac{p-9}{3} = 2 \times \dfrac{3}{2}$$

Her second line is incorrect. It should read _____..

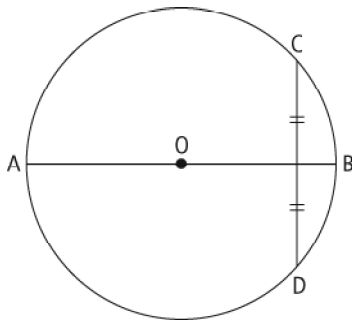44. The number line below represents the inequality _____.

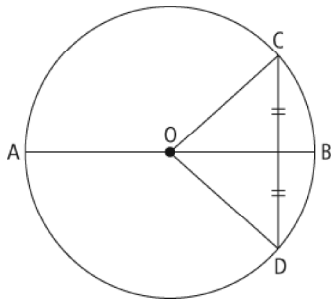

45. The solution to $2y < 8$ is _____.

46. The solution to $\dfrac{a}{-1.5} \geq 3$ is _____.
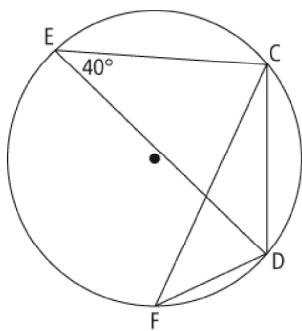

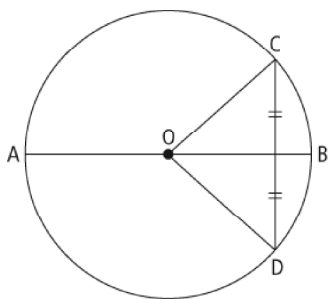47. The solution to $\dfrac{(x+2)}{3} > 2$ is _____.

48. Line CD represents a _____.
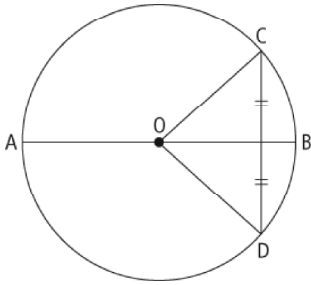
49. In the diagram below, what does ∠COD represent? .

50. In the diagram shown, ∠CED is an example of a(n) _____.

51. Chord CD touches the circumference of the circle at points C and D. Line OB runs from the centre to a point on the circumference, B. Line OB is a(n) _____ of chord CD.

52. The distance along the circumference of the circle, from point C to point D, is a(n) _____.

53. Line HJ touches the circumference of the circle at point A, and forms a 90° angle with line AB. Point A is a(n) _____.
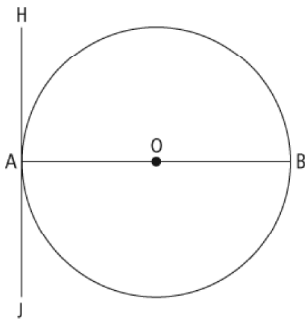
54. If a question might offend people of a different cultural group, the influencing factor would be called _____.

55. A(n) _____ sample is created by choosing survey respondents who are readily accessible.

56. A sample population is often surveyed to make _____ about the whole population from which it was drawn.

57. Theoretical probability is calculated as _____.

58. Two kinds of probability are _____ and _____.

59. The solution to $1 - \dfrac{x}{2} < \dfrac{x+2}{3}$ is _____.

60. Complete the expression with the symbols <, >, or =.

a) $\dfrac{5}{14} \square\ 0.4$

b) $2\dfrac{4}{7} \square\ 2\dfrac{3}{8}$

c) $0.\overline{6} \square\ 0.\overline{3}+\dfrac{1}{3}$

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

61. Calculate the dimensions of a square that has the same area as a circle with a radius of 5.7 cm. Round your answer to the nearest tenth of a centimetre.

62. Tia travels from her home in Kelowna to visit a friend in Edmonton. The cost of a taxi from her home to the airport is $15.00 each way. The cost of her round-trip flight is $256.80. She stays at a hotel for three nights, at a cost of $87.20 per night. How much does Tia spend, in total, on her trip?

63. Hakim and Joe bought a large pizza. They split the pizza in half. Joe ate $\dfrac{7}{10}$ of his half. Hakim ate $\dfrac{7}{8}$ of his half.

a) Describe the steps you would use to determine how much of the large pizza each boy ate.
b) How much of the pizza did Joe eat? How much did Hakim eat? Express your answers as fractions in lowest terms.

.

64. Express each number as a product of two powers.
 a) 100
 b) 108
 c) 72
 d) 2500

65. Evaluate.

a) $\dfrac{6^3-4^3}{2\left(2^2\times 19\right)}$

b) $(82-2)-2\left(\dfrac{3^3-2^7}{5}\right)$
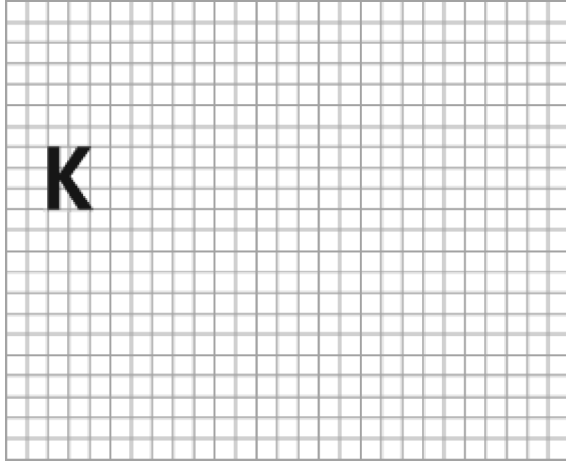
c) $\left(\dfrac{4-6^3}{5^2-3}\right)-2^3$

d) $\left(\dfrac{9^3-36}{8^2\times 4}\right)+3\left(\dfrac{2^5}{4^2}\right)$

66. Write an expression using exponents, and determine the total area of a pair of squares, given their side lengths.
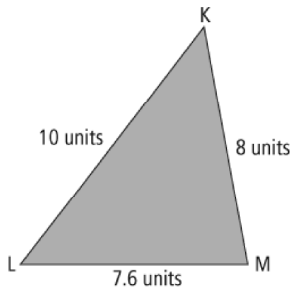 **a)** 6 cm, 7 cm
 b) 4 cm, 9 cm
 c) 8 cm, 11 cm

8

Write your answer in the space provided.

67. Use the grid provided to draw an enlargement of the letter using a scale factor of 6.

K

68. Draw a triangle similar to △KLM using a scale factor of 0.25. Label the length of each side.

10 units
8 units
7.6 units
K
L
M

69. Gail charges a flat rate per hour for babysitting for a family. In addition, she charges an hourly fee for each child she is looking after. Her flat rate per hour is twice the square of what she charges per hour for each child. Create an expression and an algebra tile model to show her hourly rate for babysitting 3 children.

70. Tracy is walking near a motion detector.
a) How far was Tracy from the sensor when she began walking?
b) Was she walking toward or away from the motion sensor at the time?
c) How long did it take her to reach the motion sensor?

Tracy's Walk
Distance (m)
Time (s)
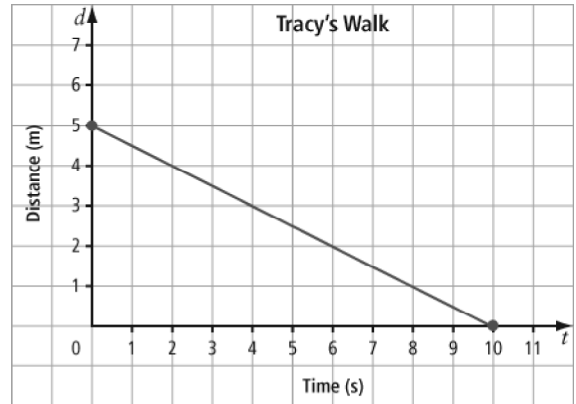
71. What is the total surface area of this rectangular prism?

2a
a
3a
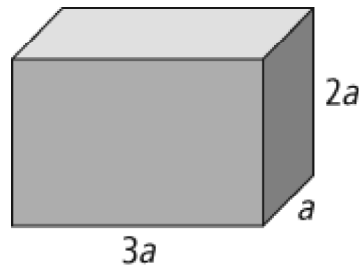
72. What is the edge length of a cube that has the same volume as the rectangular prism below? Explain your reasoning.

2x
4x
x

9
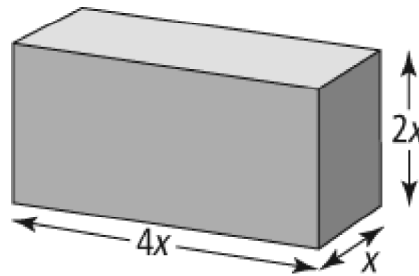
73. A chain of sporting goods stores pays its employees according to the information in the table below.

| Position	Number of Positions	Hourly Pay Rate and Weekly Bonus
Manager	5	$25/h plus $100 bonus per week for working at least 30 h
Clerk	12	$10/h plus $60 bonus per week for working at least 30 h

If all employees work at least a 30-h week and work the same number of hours, what is the simplified algebraic expression for the payroll for that week?

74. At a school dance, the student council sold cans of pop and bags of chips. The price of a can of pop is one and a half times the price of a bag of chips. The pop sells for $0.90 and they sold $288.00 worth of pop. The number of bags of chips sold is three quarters of the number of cans of pop sold. What was the income from the chips?

75. Solve and show your work.

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

76. The solution to an inequality is shown below. Represent the solution verbally and algebraically.
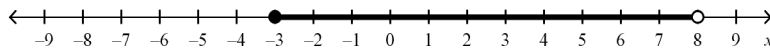
77. A triangle has side lengths $2x + 1$, $2x + 3$, and $2x - 2$. What values of x give the triangle a perimeter of 44 or more?

78. A circle with centre C has a diameter 70 mm. Chord MN is drawn in the circle. The centre of the chord, P, is 21 mm from the centre of the circle. What is the length of the chord? Express your answer to the nearest millimetre.
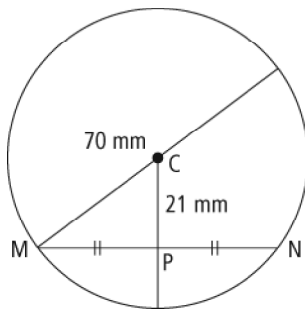
79. In the figure shown, what is the measure of the diameter of the circle?
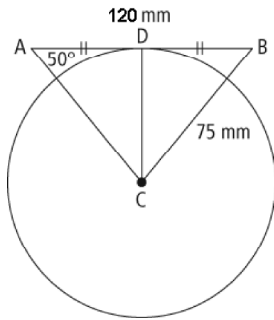
80.   A survey of 5000 students between the ages of 10 and 12 will be conducted to predict how many movies they go to in a year. Write two different survey questions that could be asked to collect the desired data.

81.   Identify each population. Suggest a sampling technique that could be used to study each issue. Describe how this could be accomplished.
a) A computer-chip company wants to test one of every 1000 chips they manufacture.
b) The federal government wants to determine the average tax bill per taxpayer.
c) A radio station wants to know the age profile of its listeners.

82.   Explain why experimental probability and theoretical probability are not always the same.

83.   The slanted faces of the roof of a house must be covered with tiles. The area of each rectangular tile is 20 cm by 30 cm. How many tiles would be needed to cover the roof?
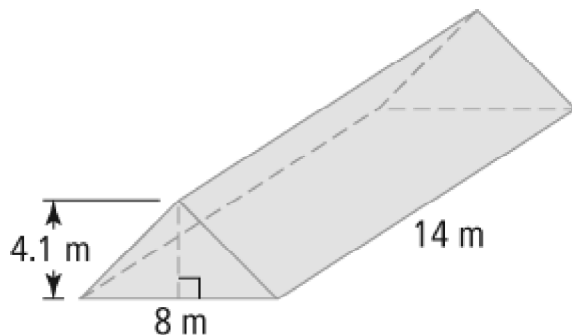
84.   Pak owned 120 shares in a technology company. On Monday, the price of the

stock was $34.16 per share. Pak sold all his shares of stock on Friday, for a total value of $4468.80.
a) Determine how much money Pak lost or gained on the sale of his shares on Friday, compared to Monday's price.
b) Determine the value of Pak's shares on Friday.

85.   The formula for the surface area of a sphere is $SA = \dfrac{\pi r^2}{3}$, where r is the radius of the sphere. What are the dimensions of a cube that has the same surface area as a sphere with a radius of 7 cm, to the nearest tenth of a centimetre?

86.   A resort had 425 people booked for 1 week. During the week, each person drank 2 cups

of tea, 1.5 times that amount of juice, and 0.75 times that amount of milk per day. Tea costs $0.10 per cup, juice costs $0.22 per cup, and milk costs $0.16 per cup. What was the total cost of beverages for the week?

.

87. The following expression uses 3s as the base, and the order of operations. The expression equals 0.
$3^3 - (3^1 \times 3^2) = 0$
a) Use a combination of four 3s as bases to make an expression equal to 0.
b) Use a combination of five 3s as bases to make an expression equal to 0.
c) Use a combination of six 3s as bases to make an expression equal to 0.

88. The population of insects in a colony doubles every month. There are currently 1000 insects in the colony. How many insects were there two months ago? Check your answer.

89. If $4^x = 7$, use exponent laws to evaluate the following expressions:
a) 4^{3x}
b) $4^{(x+2)}$

90. **a)** Describe the pattern in this series: 1, 4, 27, 256, ...
b) What are the fifth and eighth numbers in the series?

91. A map of a nature reserve shows the location of three look-out points. On the map, the distance between Point A and Point B is 4.5 cm and the distance between Point B and Point C is 6.0 cm. Each centimetre on the map represents 15 km of actual distance. Calculate the actual distance between Point A and Point C.
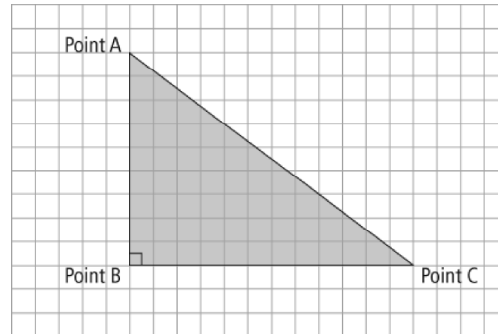
92. You can approximate the distance between you and a lightning bolt by counting the number of seconds that pass before you hear the thunder. For every kilometre of distance between you and the lightning, the time that passes before you hear the thunder increases by 3 s.

a) Complete the following table of values.

Distance, d (km)	Time, t (s)
0	
1	
2	
3	
4	
5	

b) Graph the linear relation represented by the table of values.
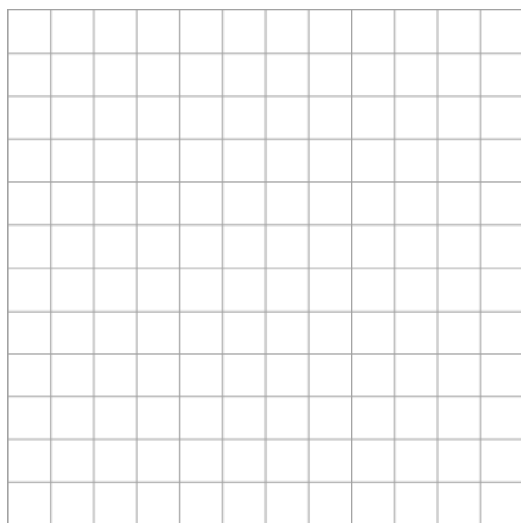
c) Interpolate to determine how much time passes before you hear the thunder at a distance of 4.5 km from the lightning strike.

**d)** How far away are you if you hear the thunder in 6.5 s?

93. The dimensions of a package for an MP3 player are 5 cm, y cm, and $3y$ cm.
a) What is the expanded form of the expression for the surface area of the package?
b) What is the expanded form of the expression for the volume of the package?
c) If $y = 3$, what is the surface area and the volume of the package?

94. A rectangle, twice as long as it is wide, is inscribed in a circle. What is the ratio of their areas?
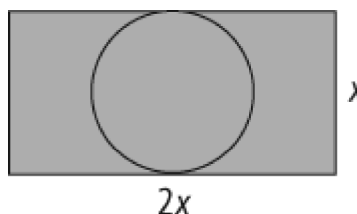
95. The annual rainfall in Winnipeg is 9 mm more than $1\frac{1}{3}$ times the annual rainfall in Calgary. If the annual rainfall in Winnipeg is 415.6 mm, what is the annual rainfall in Calgary, to the nearest hundredth of a millimetre?

96. A degu is a small animal native to Chile. When kept as a pet, it has a maximum lifespan of 10 years.
a) Graph the inequality that represents the degu's lifespan when kept as a pet.
b) Explain how you created your illustration.

97. Ryan bought $5\frac{1}{2}$ gallons of paint. After he had used some of the paint to paint his garage, he still had more than $1\frac{3}{4}$ gallons left. How much paint did he use?

98. Statsville High School has 240 students in grade 9, 220 in grade 10, 205 in grade 11, and 190 in grade 12. The administration wants to know if students would prefer a semestered timetable.
a) Describe the population.
b) Design a sampling procedure to sample 15% of the students.
c) Describe how you will collect the data.
d) Describe how you will display the data.
e) Describe how you would analyse the data.
f) Describe how you would present your findings and what would be included.

99. A scientist randomly observes a rabbit to determine how much it sleeps. He found that the probability of observing the rabbit sleeping was 0.45. Predict how many hours a day the rabbit spends sleeping.

100. A ski jumper starts from rest. Her maximum speed during the jump is 27.6 m/s.
a) Determine an inequality that represents the speed of the ski jumper.
b) Sketch a number line to represent the inequality.