

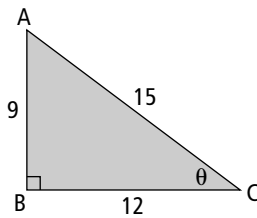
## Chapters 1–9 Cumulative Review

1. For each system of linear equations, explain how you could verify whether the given point is a solution. Is the given point a solution?

a)  $y = 2x - 12$   
 $y = -3x + 13$   
 $(5, -2)$

b)  $4x + y = 7$   
 $-x + 2y = -5$   
 $(1, 3)$

2. A semicircular window of radius 14 in. is to be laminated with a sun block coating. The coating costs 12 cents per square centimetre. What is the cost to laminate the window?
3. Write each trigonometric ratio in lowest terms.



- a)  $\sin A$     b)  $\sin C$     c)  $\cos A$   
d)  $\cos C$     e)  $\tan A$     f)  $\tan C$

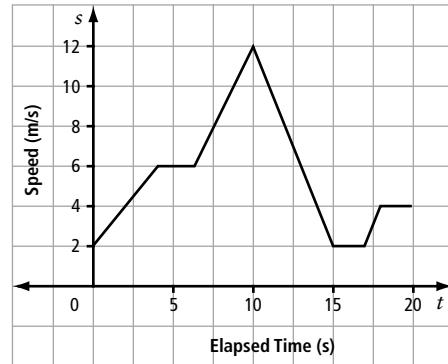
4. What is the value of each expression? Express your answers as integers or fractions.

- a)  $4^3$   
b)  $-25^2$   
c)  $(-7)^2$   
d)  $-\frac{3^3}{5}$   
e)  $\frac{3}{4^3}$   
f)  $\left(\frac{-1}{5}\right)^3$

5. Multiply. Then, combine like terms.

a)  $6(-2n + 3)(5n - 2) + (2n - 3)^2$   
b)  $(4s^2 + 2s - 3)(-s^2 - s + 5)$

6. Describe a possible scenario for the following graph.



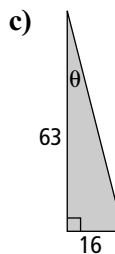
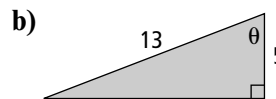
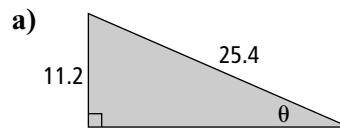
7. Solve each system of linear equations graphically. Verify your solution.

a)  $y = -x - 4$   
 $y = -3x + 8$

b)  $2x + y = -6$   
 $-x + 2y = 3$

c)  $y = -2x - 5$   
 $y = -3x - 4$

8. Determine the measure of each angle  $\theta$  to the nearest tenth of a degree.



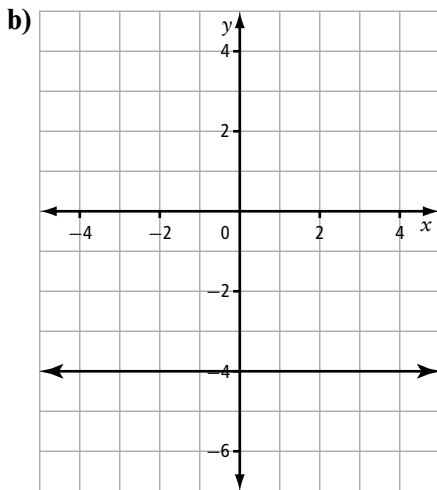
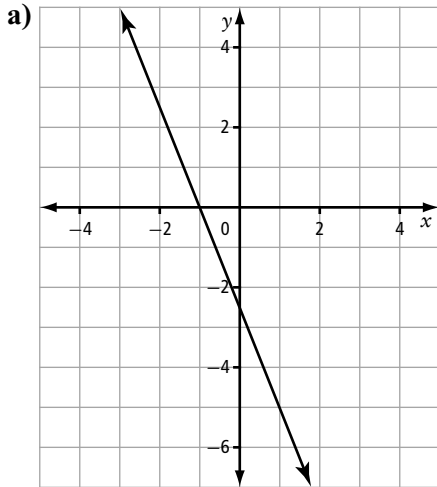
9. What are the slope and y-intercept of each line?

a)  $y = -5x + 8$

b)  $3x - 7y - 10 = 0$

- 10.** Calculate the surface area of each object. Round your answer to the nearest hundredth of a unit.
- A right cone has a circular base with a radius of 18 cm and slant height of 29.3 cm.
  - A right cone having a circular base has a slant height of 12 in. and a diameter of 5 in.
  - A pyramid has a square base with sides 54 cm and a slant height of 74 cm.
  - A sphere has a diameter of 31 cm.

- 11.** For each line, state the domain, range, intercepts, and slope. What is the equation of each line in general form?



- 12.** Identify the greatest common factor of each set of terms.
- $18a^3b^2$  and  $8ab^3$
  - $27x^4y^2$  and  $63xy^4z$
  - $19p^4q$ ,  $-9pq^6$ , and  $81p^3q^3$

- 13.** Bees maintained by beekeepers in Alberta produce about 13 million kilograms of honey per year. Suppose the average price of honey is \$10.98 per kilogram. Consider the relationship between the total amount of money each beekeeper receives and the number of kilograms of honey the beekeeper sells.

- Is this relationship linear or non-linear?
- Assign a variable to represent each quantity in the relation. Which variable is the dependent variable? Which is the independent variable? How do you know?
- Honey production in Alberta is 90 kg per hive. Create a table of values for the relationship.
- Are the data discrete or continuous? Explain how you know.
- Graph the relationship.

- 14.** Determine whether each linear system has no solution, one solution, or an infinite number of solutions.

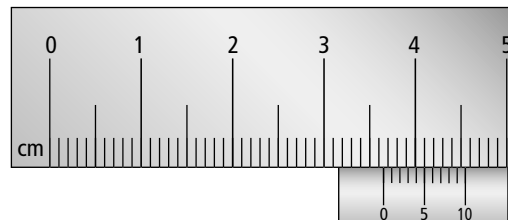
- $$y = \frac{2}{5}x + 9$$

$$y = \frac{5}{2}x + 9$$
- $$2x - 6y + 17 = 0$$

$$-2x + 6y + 17 = 0$$
- $$-5x - 8y = 12$$

$$10x + 16y = -24$$

- 15.** What reading is shown on this SI caliper? Name an object that could be this length.



16. Solve by substitution.

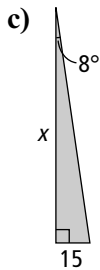
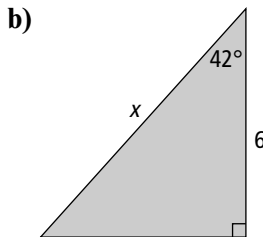
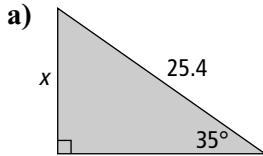
a)  $y = 3x - 2$

$x + y = 6$

b)  $3x - 2y = 10$

$4x + y = -5$

17. Determine the measure of each side length  $x$ . Express your answer to the nearest tenth of a unit.



18. Evaluate each expression. Use positive exponents to express the answers.

a)  $(x^5)(x^{-\frac{2}{5}})$

b)  $(256^{-0.25})^3$

c)  $\frac{(z^3)^{\frac{3}{2}}}{(z^4)^2}$

d)  $(125p^3)^{\frac{-1}{3}} (p^{-\frac{3}{2}})$

e)  $\left[ \frac{x^{-3}}{(xy)^5} \right]^{-25}$

f)  $\left[ \frac{x^{-3}}{0.16(y^{-6})} \right]^{-\frac{3}{4}}$

19. Factor completely.

a)  $4x^2 + 7x - 2$

b)  $x^2 - 9x + 18$

c)  $-24m^2 + 42mn - 9n^2$

d)  $35x^2 - 11xy - 6y^2$

e)  $12s^2t + 24st - 288t$

20. Solve using elimination.

a)  $2x + y = 6$

$x + y = 2$

b)  $y = 5 - 3x$

$4x + 3y = 20$

21. Read the following paragraph about Lake Athabasca. Convert each measurement to the unit specified.

Lake Athabasca is the largest and deepest lake in both Alberta and Saskatchewan and the eighth largest in Canada. The lake is 283 km (miles) in length and has a maximum width of 31 miles (kilometres). The average depth of the lake is 20 m (feet). The surface elevation is 700 ft (metres).

22. Calculate the missing dimension in each of the following. Round each answer to the nearest hundredth of a unit.

a) A cylinder has a volume of  $1 \text{ ft}^3$  and a height of 0.7 ft.

b) A right cone has a circular base with a radius of 35 cm and a volume of  $7500 \text{ cm}^3$ .

c) A square-based pyramid has a height of 91 cm and a volume of  $5.7 \text{ m}^3$ .

d) A sphere has a volume of  $3476 \text{ cm}^3$ .

23. Order each set of numbers from least to greatest. Then, identify the irrational numbers.

a)  $\frac{4}{9}, 0.77\dots, \sqrt{82}, \sqrt[3]{634}$

b)  $\sqrt[5]{67}, \sqrt{289}, 14\frac{1}{3}, \sqrt[4]{1296}$

24. A relation is given by the formula  $t = 6.3s - 5.8$ . If the domain of the relation is  $[-2, 12]$ , what is the range?
25. Use slope-point form to write an equation of a line through each point with the given slope. Express each answer in slope-intercept form and in general form.
- $(-2, -1)$  and  $m = -3$
  - $(3, -9)$  and  $m = \frac{3}{4}$

26. Factor completely.

- $c^2 - 169$
- $81 - 16y^4$
- $175h^2 - 1008f^2$
- $x^4 - 41x^2 + 100$

27. Twyla is collecting pledges as she prepares to enter a 20-km charity run. She donates \$40 of her own money and collects pledges of \$20 each. The function  $P(n) = 20n + 40$  represents the total amount of money that Twyla raises.

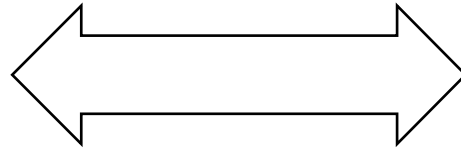
- Determine an appropriate domain and range. Then, use a table of values to graph the function.
- Determine the value for  $P(9)$ . Explain the meaning of your answer.
- Awards are presented to students who raise more than \$520. How many pledges must Twyla collect to receive an award?
- Explain why this situation depicts a function.

28. Write the equation of a line that passes through  $(-2, 0)$  and is parallel to  $5x - 4y + 8 = 0$ .

29. Verify that each trinomial is a perfect square. Then, factor.

- $9s^2 - 54s + 81$
- $16s^3 + 96s^2 + 144s$
- $256 - 160y + 25y^2$

30. Use the figure below to answer the following questions.



- What is the perimeter of the figure in centimetres? in millimetres?
- What is the perimeter of the figure in inches?
- Is it necessary to measure all the sides of the figure three times to answer parts a) and b)? Explain.

31. You are standing 15 ft from a three-storey building observing a worker on the roof. The angle of elevation of your line of sight to the top of the worker's head is  $62^\circ$ . If your eyes are 5.1 ft from the ground and the building is 27 ft high, how tall is the worker?

32. Express each entire radical as an equivalent mixed radical.

- $\sqrt{40}$
- $\sqrt{18}$
- $\sqrt[3]{108}$
- $\sqrt[4]{162}$

33. Determine the slope of each line.

