

1201 Common Mathematics Assessment  
Answer Sheet

Name: \_\_\_\_\_

Mathematics Teacher: \_\_\_\_\_

- |     |   |   |   |   |     |   |   |   |   |
|-----|---|---|---|---|-----|---|---|---|---|
| 1.  | A | B | C | D | 21. | A | B | C | D |
| 2.  | A | B | C | D | 22. | A | B | C | D |
| 3.  | A | B | C | D | 23. | A | B | C | D |
| 4.  | A | B | C | D | 24. | A | B | C | D |
| 5.  | A | B | C | D | 25. | A | B | C | D |
| 6.  | A | B | C | D | 26. | A | B | C | D |
| 7.  | A | B | C | D | 27. | A | B | C | D |
| 8.  | A | B | C | D | 28. | A | B | C | D |
| 9.  | A | B | C | D | 29. | A | B | C | D |
| 10. | A | B | C | D | 30. | A | B | C | D |
| 11. | A | B | C | D | 31. | A | B | C | D |
| 12. | A | B | C | D | 32. | A | B | C | D |
| 13. | A | B | C | D | 33. | A | B | C | D |
| 14. | A | B | C | D | 34. | A | B | C | D |
| 15. | A | B | C | D | 35. | A | B | C | D |
| 16. | A | B | C | D | 36. | A | B | C | D |
| 17. | A | B | C | D | 37. | A | B | C | D |
| 18. | A | B | C | D | 38. | A | B | C | D |
| 19. | A | B | C | D | 39. | A | B | C | D |
| 20. | A | B | C | D | 40. | A | B | C | D |



**Mathematics 1201**  
**Common Mathematics Assessment**  
**June 12, 2012**

Name: \_\_\_\_\_

Mathematics \_\_\_\_\_

Teacher: \_\_\_\_\_

40 Selected Response  
12 Constructed Response

40 marks  
40 marks

**FINAL**

**80 Marks**

**FORMULAE**

**Surface Area**

|   |                                   |                             |
|---|-----------------------------------|-----------------------------|
| <b>Cylinder</b><br>$2\pi r^2 + 2\pi rh$ | <b>Cone</b><br>$\pi r^2 + \pi rs$ | <b>Sphere</b><br>$4\pi r^2$ |
|---|-----------------------------------|-----------------------------|

**Volume**

|                                   |                                       |                                       |
|-----------------------------------|---------------------------------------|---------------------------------------|
| <b>Pyramid</b><br>$\frac{1}{3}Ah$ | <b>Cone</b><br>$\frac{1}{3}\pi r^2 h$ | <b>Sphere</b><br>$\frac{4}{3}\pi r^3$ |
|-----------------------------------|---------------------------------------|---------------------------------------|

**Conversions**

|  |                 |                                |
|--|-----------------|--------------------------------|
| 1 foot = 12 inches                                 | 1 yard = 3 feet | 1 mile = 1760 yards            |
| 1 inch = 2.54 centimetres $\doteq$ 2.5 centimetres |                 | 1 mile $\doteq$ 1.6 kilometres |

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Selected Response: Circle the appropriate response on the answer sheet or SCANTRON.

1. How many 20 cm lengths of a pipe can be cut from a pipe 6.4 m long?
  - A. 30
  - B. 32
  - C. 33
  - D. 35
  
2. What is 170 centimetres expressed in feet and inches?
  - A. 5 ft 6 in
  - B. 5 ft 7 in
  - C. 5 ft 8 in
  - D. 6 ft 8 in
  
3. A car is travelling at 90 kilometres per hour. If the speed limit is 30 miles per hour, how many miles per hour is the car over the speed limit?
  - A. 26 mi/h
  - B. 38 mi/h
  - C. 56 mi/h
  - D. 60 mi/h
  
4. The surface area of a cone with a radius of 5 cm is  $235.62 \text{ cm}^2$ . What is the slant height?
  - A. 3 cm
  - B. 10 cm
  - C. 20 cm
  - D. 141 cm
  
5. The volume of a right cylinder is  $729 \text{ in.}^3$ . What is the volume of a right cone with the same base and height?
  - A.  $243 \text{ in.}^3$
  - B.  $365 \text{ in.}^3$
  - C.  $729 \text{ in.}^3$
  - D.  $2187 \text{ in.}^3$

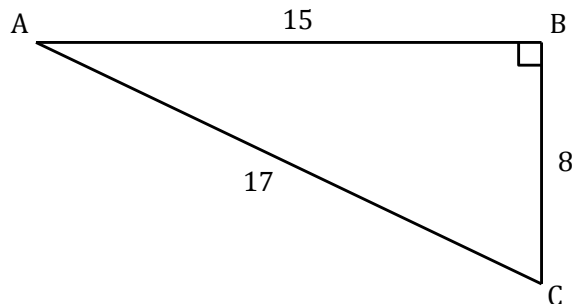
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6. How much air is needed to fill a volleyball with a diameter of 10 inches?

- A. 314 in.<sup>3</sup>
- B. 524 in.<sup>3</sup>
- C. 1256 in.<sup>3</sup>
- D. 4189 in.<sup>3</sup>

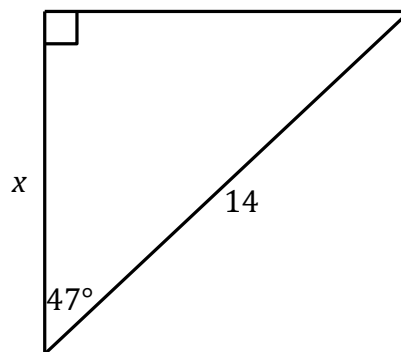
7. Which ratio represents  $\sin A$ ?

- A.  $\frac{8}{17}$
- B.  $\frac{8}{15}$
- C.  $\frac{15}{17}$
- D.  $\frac{17}{8}$



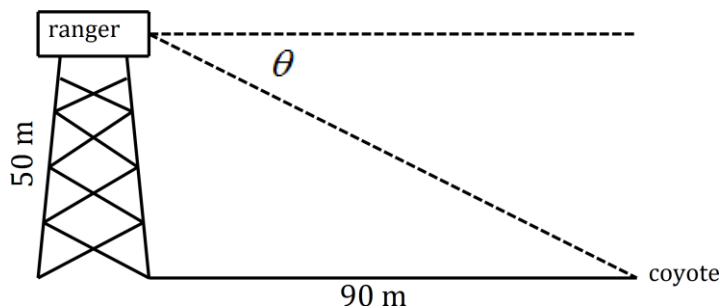
8. Which equation should be used to solve for  $x$  in the triangle below?

- A.  $\cos 47^\circ = \frac{14}{x}$
- B.  $\cos 47^\circ = \frac{x}{14}$
- C.  $\sin 47^\circ = \frac{14}{x}$
- D.  $\sin 47^\circ = \frac{x}{14}$



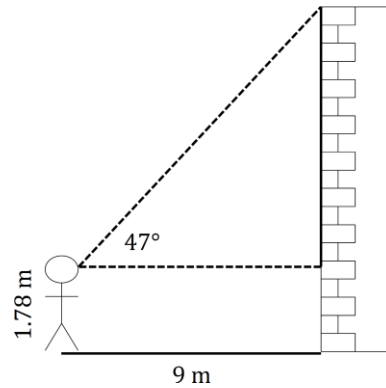
9. A forest ranger spots a coyote approximately 90 m away from the tower. If the ranger is at the top of the 50 m tower, at what angle of depression was the coyote spotted?

- A. 29°
- B. 34°
- C. 56°
- D. 61°



10. Brad used a clinometer and a tape measure to determine the height of his school. What is the height of the school?

- A. 6.58 m
- B. 8.36 m
- C. 9.65 m
- D. 11.43 m



11. What is the LCM of 12 and 18?

- A. 6
- B. 18
- C. 36
- D. 216

12. Which set of numbers has only rational numbers?

- A.  $\{\sqrt{7}, 3.125, \sqrt[3]{-27}\}$
- B.  $\{\frac{1}{3}, \pi, \sqrt{12}\}$
- C.  $\{-1.\overline{32}, \sqrt[3]{\frac{8}{125}}, 3\sqrt{9}\}$
- D.  $\{\sqrt{18}, \sqrt[3]{24}, 8.129735 \dots\}$

13. What is the index of  $2\sqrt[3]{4^5}$ ?

- A. 2
- B. 3
- C. 4
- D. 5

14. Which is equivalent to  $\sqrt[3]{7^2}$ ?

A.  $\frac{2}{7^3}$

B.  $\frac{3}{7^2}$

C.  $\frac{1}{\frac{2}{7^3}}$

D.  $\frac{1}{\frac{3}{7^2}}$

15. Which is equivalent to  $\left(-\frac{1}{2}\right)^{-3}$ ?

A.  $(-2)^3$

B.  $\left(-\frac{1}{2}\right)^3$

C.  $\left(\frac{1}{2}\right)^3$

D.  $2^3$

16. Simplify:  $\frac{(x^2)^4}{x^{-3}}$

A.  $x^{-4}$

B.  $x^5$

C.  $x^{11}$

D.  $x^{20}$

17. Simplify:  $(2k^2)^0(3k^3)^2$

A.  $18k^8$

B.  $12k^8$

C.  $9k^6$

D.  $3k^6$

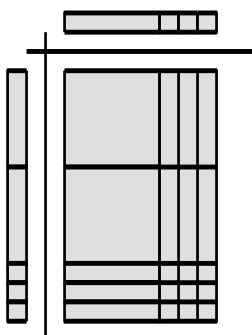
18. Factor completely:  $8x^2 - 20x$

- A.  $2(x^2 - 10x)$
- B.  $4(x^2 - 5x)$
- C.  $2x(4x - 10)$
- D.  $4x(2x - 5)$

19. Expand and simplify:  $(x - 9)(x^2 - x + 5)$

- A.  $x^3 + 10x^2 + 14x - 45$
- B.  $x^3 + 8x^2 + 14x - 45$
- C.  $x^3 - 8x^2 + 14x - 45$
- D.  $x^3 - 10x^2 + 14x - 45$

20. Which expression represents the model below?



- A.  $(2x + 3)(x + 3)$
- B.  $(2x + 3)(x + 9)$
- C.  $(3x + 3)(x + 3)$
- D.  $(3x + 3)(x + 9)$

21. Which represents the model below?

|        |       |
|--------|-------|
| $2x^2$ | $-3x$ |
| $10x$  | $-15$ |

- A.  $(x - 5)(2x - 3)$
- B.  $(x - 5)(2x + 3)$
- C.  $(x + 5)(2x - 3)$
- D.  $(x + 5)(2x + 3)$

22. Expand and simplify:  $(2x - 3)^2$

- A.  $4x^2 + 12x + 9$
- B.  $4x^2 - 12x + 9$
- C.  $4x^2 + 9$
- D.  $4x^2 - 9$

23. Factor:  $x^2 + 5x - 24$

- A.  $(x - 8)(x - 3)$
- B.  $(x - 8)(x + 3)$
- C.  $(x + 8)(x - 3)$
- D.  $(x + 8)(x + 3)$

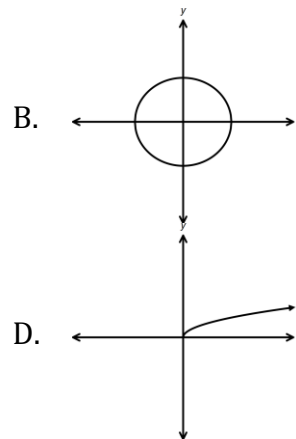
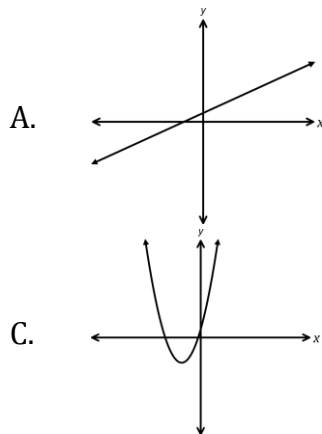
24. Factor:  $121x^2 - 36y^2$

- A.  $(121x + 36y)(121x + 36y)$
- B.  $(121x + 36y)(121x - 36y)$
- C.  $(11x + 6y)(11x + 6y)$
- D.  $(11x + 6y)(11x - 6y)$

25. The amount of sunlight affects the height of the plant.  
What is the independent variable?

- A. The amount of sunlight.
- B. The amount of water.
- C. The height of the plant.
- D. The type of soil.

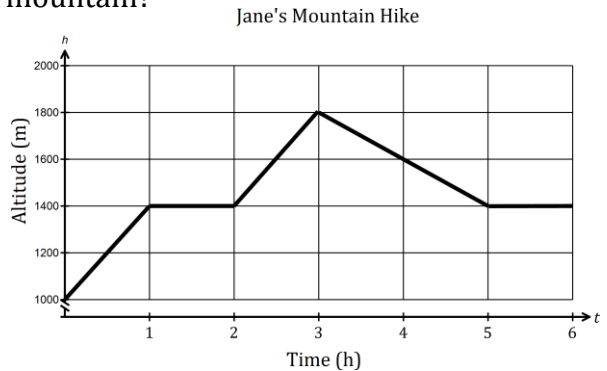
26. Which of the graphs does NOT represent a function?





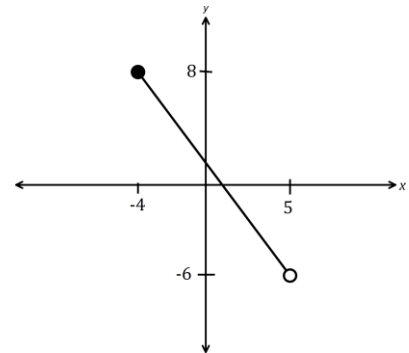
27. Jane went on a mountain hike.  
The graph shows her altitude for the duration of the hike.  
What time interval was she climbing down the mountain?

- A. 0 – 1 hours
- B. 1 – 3 hours
- C. 3 – 5 hours
- D. 5 – 6 hours



28. What is the range of the graph?

- A.  $[-4, 5)$
- B.  $(-4, 5]$
- C.  $[-6, 8)$
- D.  $(-6, 8]$



29. If  $h(t) = \frac{2}{3}t - 4$ , what is  $h(6)$ ?

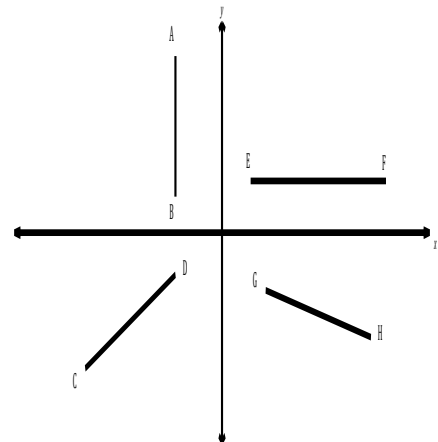
- A. -2
- B. 0
- C. 8
- D. 15

30. Which ordered pair represents  $g(-2) = 5$ ?

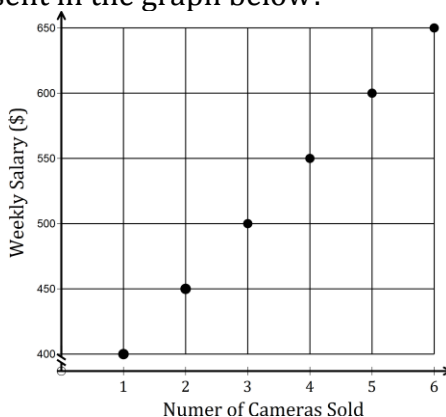
- A.  $(-5, 2)$
- B.  $(-2, 5)$
- C.  $(2, -5)$
- D.  $(5, -2)$

31. Which line segment has a positive slope?

- A.  $\overline{AB}$
- B.  $\overline{CD}$
- C.  $\overline{EF}$
- D.  $\overline{GH}$



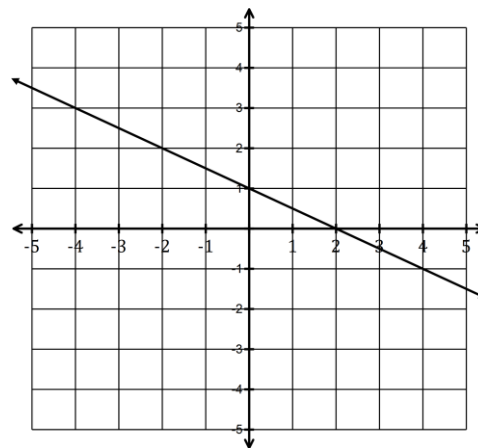
32. What does the slope represent in the graph below?



- A. The increase in salary per camera sold.
- B. The number of cameras sold per salary increase.
- C. The price of the camera.
- D. The weekly salary.

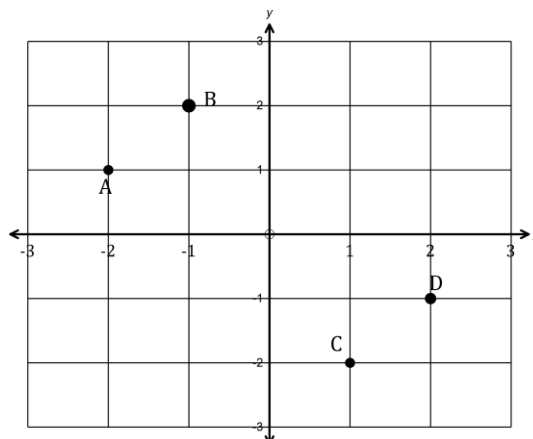
33. What is the equation of the line below?

- A.  $y = -2x + 2$
- B.  $y = -2x + 1$
- C.  $y = -\frac{1}{2}x + 2$
- D.  $y = -\frac{1}{2}x + 1$



34. The line  $y - 2 = \frac{1}{3}(x + 1)$  passes through which point?

- A. A
- B. B
- C. C
- D. D



35. What is the value of  $a$ , such that the line passing through points  $(6, 2)$  and  $(9, a)$  has a slope of  $-1$ ?

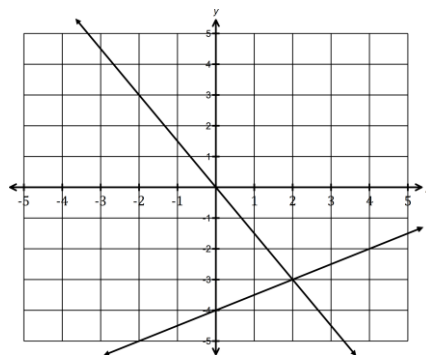
- A.  $a = -5$
- B.  $a = -1$
- C.  $a = 1$
- D.  $a = 5$

36. Which is equivalent to  $y + 2 = \frac{1}{3}(x - 5)$ ?

- A.  $x - y - 7 = 0$
- B.  $x - y - 11 = 0$
- C.  $x - 3y - 7 = 0$
- D.  $x - 3y - 11 = 0$

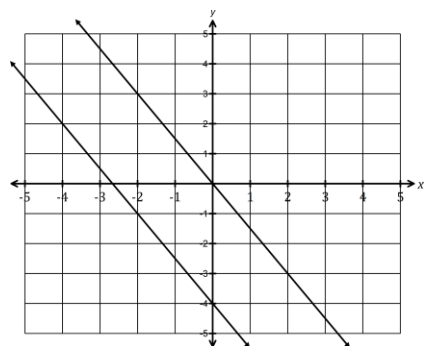
37. What is the solution to the linear system?

- A.  $(-3, 2)$
- B.  $(0, 0)$
- C.  $(0, -4)$
- D.  $(2, -3)$



38. How many solutions are there for this linear system?

- A. 0
- B. 1
- C. 2
- D. Infinite



39. Solve for  $x$ : 
$$\begin{cases} x - y = 4 \\ 3x + y = 0 \end{cases}$$

- A.  $x = -2$
- B.  $x = -1$
- C.  $x = 0$
- D.  $x = 1$

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40. Joan and Kimberley downloaded music videos last month.  
The detailed cost is listed below.

|           | Music | Video | Total Cost |
|-----------|-------|-------|------------|
| Joan      | 4     | 2     | \$12       |
| Kimberley | 6     | 4     | \$22       |

Which system of equations represents the situation?

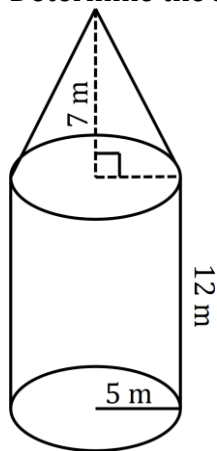
- A.  $\begin{cases} 4m + 6v = 12 \\ 2m + 4v = 22 \end{cases}$
- B.  $\begin{cases} 4m + 4v = 22 \\ 6m + 2v = 12 \end{cases}$
- C.  $\begin{cases} 4m = 12 - 2v \\ 6m = 22 - 4v \end{cases}$
- D.  $\begin{cases} 4m = 2v - 12 \\ 6m = 4v - 22 \end{cases}$

Constructed Response: Calculator Permitted.

Answers to be written on this paper in the space provided. Show all workings.

41. Determine the surface area of the composite figure (to the nearest square metre).

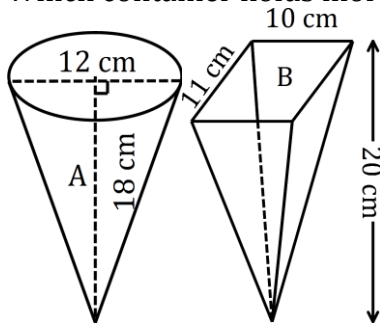
[4 points]



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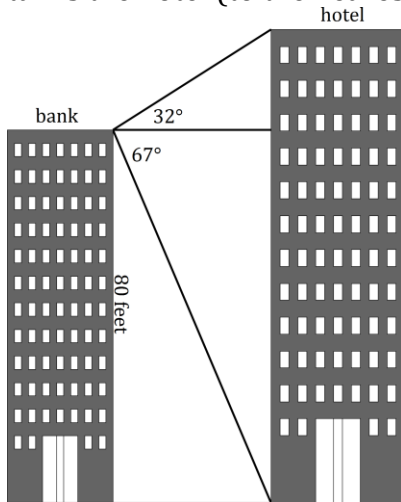
42. Which container holds more? Justify your answer.

[3 points]



43. From the top of a bank, the angle of inclination to the top of a hotel is  $32^\circ$ . The angle of depression to the base of the hotel is  $67^\circ$ . If the height of the bank is 80 feet, how tall is the hotel (to the nearest foot)?

[3 points]



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44. The volume of a cube is  $216 \text{ cm}^3$ . [3 points]  
Determine the length of the diagonal of one of its faces, expressed as a mixed radical, in simplest form.

45. Simplify completely. Write your answer using positive exponents. [4 points]

$$\frac{\left(x^{\frac{1}{2}}y^{-\frac{3}{5}}\right)\left(x^{\frac{3}{2}}y^{-\frac{2}{5}}\right)}{\left(x^{-3}y^2\right)^2}$$

46. Factor completely: [3 points]

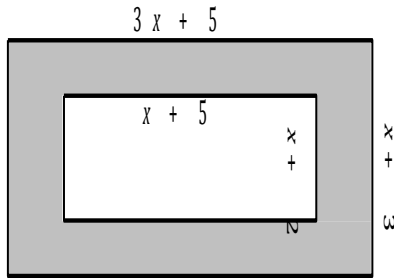
$$12x^2 + 20x + 8$$

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47. Determine the area of the shaded region, in simplest form.

[4 points]



48. The function,  $M(E) = \frac{E}{3.5}$  can be used to approximate weight,  $M$ , in kilograms, on Mercury, where  $E$ , in kilograms, is weight on Earth.

[3 points]

a) Suppose an astronaut weighs 68 kg on Earth.  
What is their weight on Mercury (to the nearest kg)?

b) Suppose an alien weighs 12 kg on Mercury.  
What is their weight on Earth (to the nearest kg)?

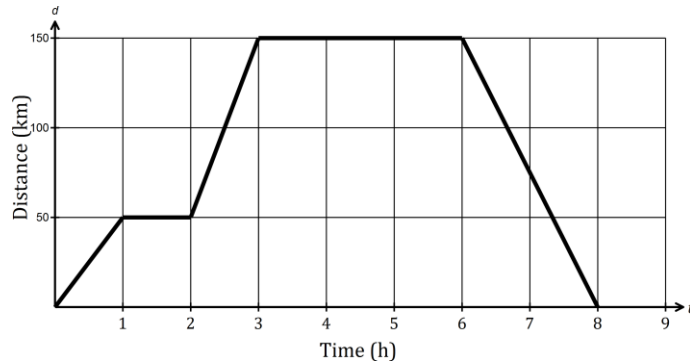
c) What is the domain of this function?

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49. Students from Eastern High School had a ski trip to White Hills in Clarendville. The graph below represents their trip. Accurately describe the trip, including references to speed and direction.

[3 points]



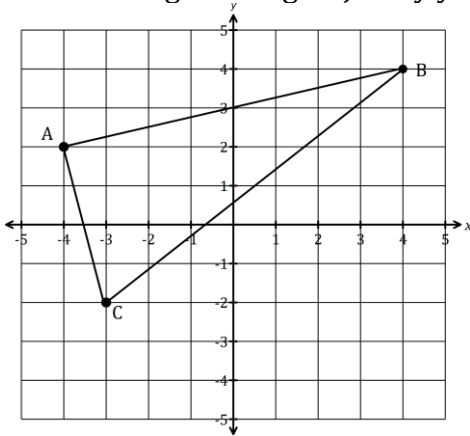
50. Determine the equation of the line passing through  $(-3, 4)$  and  $(3, 2)$  in general form.

[3 points]



51. Is  $\triangle ABC$  a right triangle? Justify your answer.

[3 points]



52. Algebraically solve the linear system:

[4 points]

$$\begin{cases} -3x + 2y = -13 \\ 2x - 7y = 3 \end{cases}$$