

Choose a circle to show how much each sentence is like you

Very Unlike Me 1	Unlike Me 2	Like Me 3	Very Like Me 4
---------------------	----------------	--------------	-------------------

**01.** I like maths at school.

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
-----------------------	-----------------------	-----------------------	-----------------------

**02.** I am good at maths.

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
-----------------------	-----------------------	-----------------------	-----------------------

**03.** My teacher thinks I am good at maths.

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
-----------------------	-----------------------	-----------------------	-----------------------

**04.** My Mum and Dad think I am good at maths.

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
-----------------------	-----------------------	-----------------------	-----------------------

**05.** I enjoy doing maths in my own time (not at school).

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
-----------------------	-----------------------	-----------------------	-----------------------

**06.** I enjoy doing things in maths that I haven't tried before.

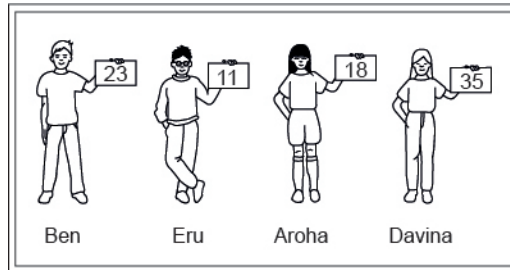
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
-----------------------	-----------------------	-----------------------	-----------------------

ADMINISTER ONSCREEN ONLY

## Practice Questions

These practice questions are to help you understand how to show your answer for different types of questions.

**P01.** Who is holding a card with an even number on it?

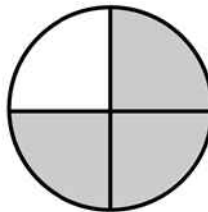


- Ben
- Eru
- Aroha
- Davina

**P02.** Complete this number pattern.

2, 4, \_\_\_\_\_, \_\_\_\_\_, 10

**P03.** What fraction of this circle is shaded?



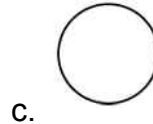
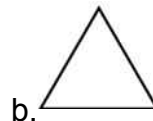
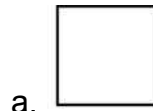
\_\_\_\_\_



**P04.** Match the sentence with the correct shape.

1. I have three sides

2. I have 4 sides



**P05.** Which numbers make this number sentence **TRUE**?

$$2 + \star > 5$$

1

2

3

4

5

**P06.** Put the numbers 1, 2, 3, and 4 in the boxes to order these numbers from biggest (1) to smallest (4).

3

7

2

0

**P07.** Select whether the following statements are True or False.

In the number 213, the value of 1 is ten.

**TRUE**

**FALSE**

In the number 504, the value of 5 is fifty.

**ADMINISTER ONSCREEN ONLY**

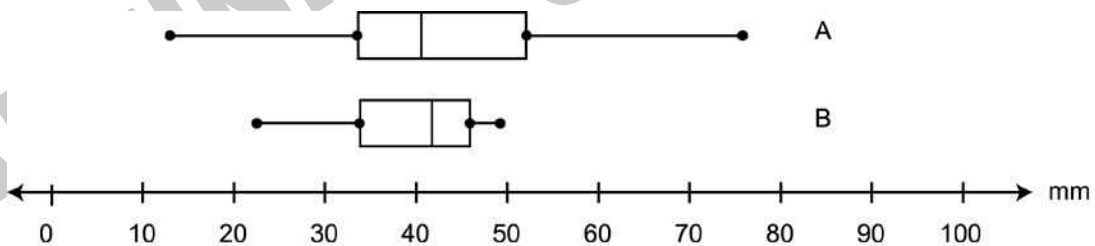
**01.** At the end of 1980, the population of Wellington, was approximately 541 000. By the end of 1990, the population had increased by about 20%.  
If the population continues to increase at this rate, what will be the population of Wellington at the end of 2020?

- 541 000
- 649 200
- 1 121 818
- 1 346 181

**02.** Abe found the mean and median of this list of numbers.  
1, 3, 3  
If the number 6 were added to the list, then

- the mean would increase.
- the mean would decrease.
- the median would increase.
- the median would decrease.

**03.** The box plots show the scores gained by two mathematics classes.  
Which of the following statements is a correct comparison of the data?



- Class A has a higher median and shows more variability than Class B.
- Class A has a lower median and shows more variability than Class B.
- Class A has a higher median and shows less variability than Class B.
- Class A has a lower median and shows less variability than Class B.

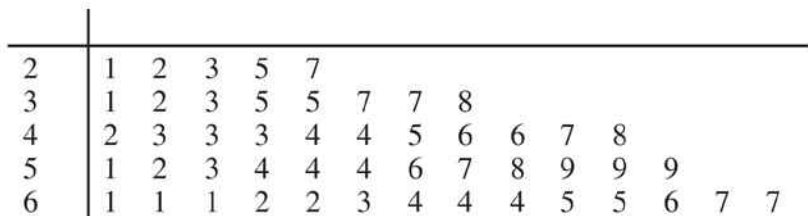
**04.** Angus was planning a survey on the smoking habits of teenagers. He made a list of possible samples to use.

- I A group of students who smoke down on the football field.
  - II A group of teenaged friends found in a nightclub on Friday night.
  - III A group of students chosen by taking every tenth person on the school roll.
  - IV A group of teenagers from the local church youth group.
  - V Every fifth teenager going through the gate at the Big Day Out concert.
- Which samples would be **MOST** likely to give a reasonably accurate picture for his survey?

- I and II
- I and III
- II and IV
- III and V
- IV and V

**05.** The stem-and-leaf plot below shows the ages of 50 teachers in the Bernard Township school system. Based on the stem-and-leaf plot, what percent of the teachers are over 50 years of age?

**Ages of 50 Teachers in the Bernard Township School System**



Key	
6	1 = 61

- 26%
- 47%
- 51%
- 52%

06. What is the order from smallest (least) to largest (greatest)?

$$P = 5.7 \times 10^3$$

$$Q = 3.9 \times 10^{-2}$$

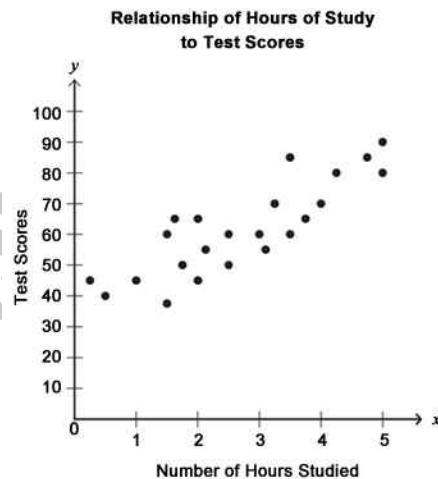
$$R = 1.8 \times 10^3$$

$$S = 8.2 \times 10^{-2}$$

- P, Q, R, S
- S, Q, R, P
- R, Q, P, S
- Q, S, R, P

07. Ms Kramer asked her students to report the number of hours they studied for their statistics test. The day after the test, she plotted the results on the scatterplot shown below.

Which of the following equations correctly approximates the line of best fit?



- $y = -10x + 30$
- $y = -10x + 60$
- $y = 10x + 30$
- $y = 10x + 60$

**08.** Joseph wanted to find out what Northland students thought about a new steel mill that is planned for the region.

He decided to conduct a survey, using a sample of students.

Which group of students would give Joseph the **MOST** representative sample?

- All the students who catch his bus each day
- A list taken by choosing every twentieth student who goes to a Northland school
- All students attending his school
- Students who respond to a questionnaire in the Northland Times newspaper

**09.** Audrey is given the following problem to solve.

Audrey has to solve for  $a$  and  $b$ .

Which of the following is **NOT** possible?

$$\begin{array}{r} aba \\ + ab \\ \hline a77 \end{array}$$

- $b$  is odd and greater than  $a$
- $a$  is even and smaller than 5
- $a$  and  $b$  are both odd numbers
- $a$  and  $b$  are both prime numbers

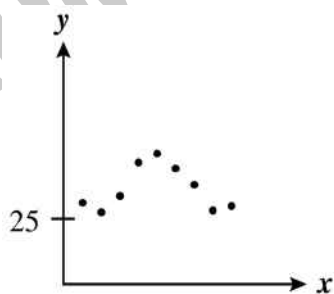
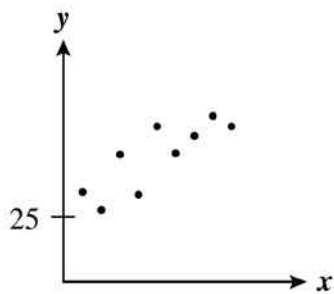
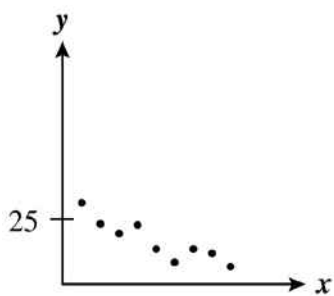
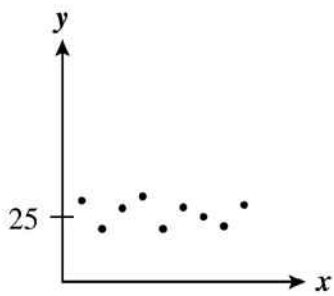
**10.** A bag contains 80 marbles that are either white, orange, or green. If 25% are green and there are four times as many white marbles as orange marbles, what percent are white?

- 12%
- 15%
- 48%
- 60%



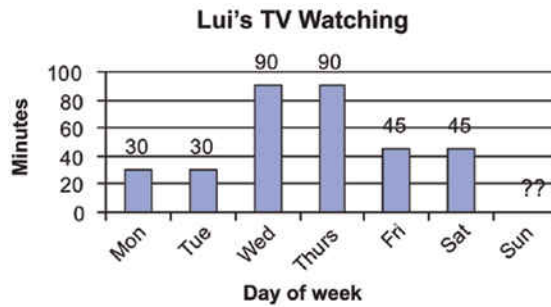
11. Which of the following scatterplots shown below would be **BEST** represented by a line of best fit (trend line) with the following equation?

$$y = 25$$



ATER ONSCREEN  
ONLY

12. Lui watches TV everyday. He watches 30 minutes on Monday and Tuesday, 90 minutes on Wednesday and Thursday, and 45 minutes on Friday and Saturday. The mean amount of time that Lui watches TV everyday is 50 minutes. How much time does Lui watch TV on Sunday?



- 20 minutes
- 30 minutes
- 45 minutes
- 50 minutes

13. A group of 48 Year 9 students were going on an excursion to the zoo. The normal price is \$120 for a group, but the school gets 40% discount.

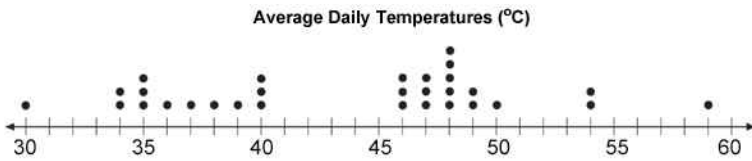
How much will each student pay for the discounted price?

\_\_\_\_\_

14. In triangle  $ABC$ ,  $AC = 6$ ,  $AB = 7$ , and  $BC = 5$ . Which is **TRUE**?

- The measure of  $\angle C$  is the least of the three angles.
- The measure of  $\angle C$  is the greatest of the three angles.
- The measure of  $\angle B$  is the greatest of the three angles.
- The measure of  $\angle B$  is the least of the three angles.

15. The line plot below shows the average daily temperature in a city for each day during the month of April.



What was the median temperature?

\_\_\_\_\_

Use the following information to answer question 16..

A sports scientist is interested in the importance of mass, muscle bulk and strength.

The scientists asked 12 students to conduct a fitness test.

The results were as follows.

Mass of Students (kg)	Circumference of biceps (cm)	Lift test (kg)
52	22	48
57	24	52
62	28	51
59	26	55
62	31	54
64	30	60
73	34	58
76	28	57
84	35	63
78	33	60
80	34	61
82	36	62

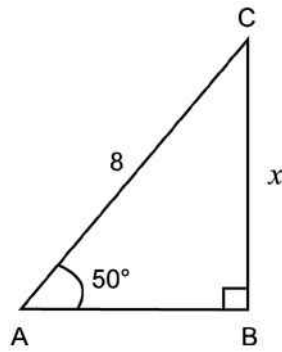
16. Write a statistical question that you wish to answer that involves comparing the data of your chosen variables from the information provided.

\_\_\_\_\_

\_\_\_\_\_

End of Section

17. Which statement is **TRUE** for the given triangle?



- $x = 8 \cos 50$
- $x = \frac{8}{\sin 50}$
- $x = \frac{\tan 50}{8}$
- $x = 8 \sin 50$

18. A marathon race is approximately 40 km. Kelly's training programme is in the table below.

He does not train on Sundays.

Kelly has told his friend Matt that in 17 weeks he will have run 34 marathons in training.

Matt says "No, you will have run \_\_\_\_\_ marathons".

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
8km	4km	16km	12km	8km	24km	0km

What is the correct whole number for Matt?

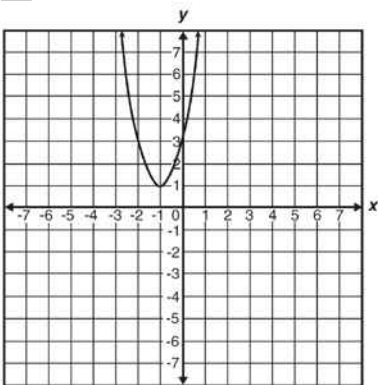
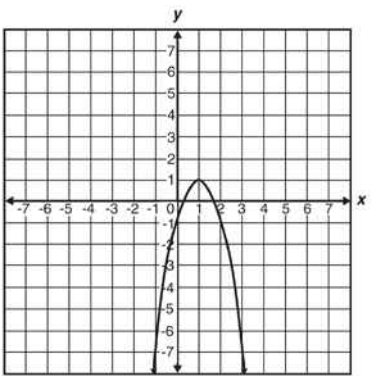
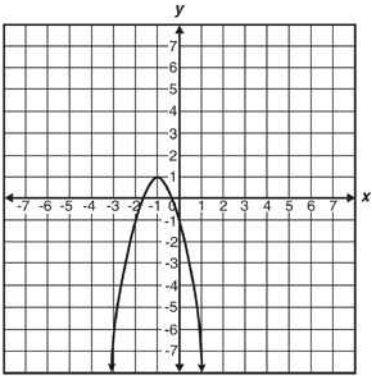
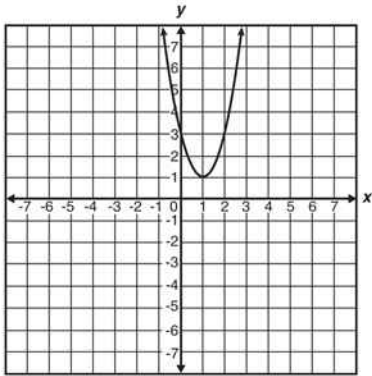
\_\_\_\_\_

19. What is the slope of the line defined by the equation shown below?

$$5x + 2y = 10$$

- $-\frac{2}{5}$
- $-\frac{5}{2}$
- $\frac{5}{2}$
- $\frac{2}{5}$

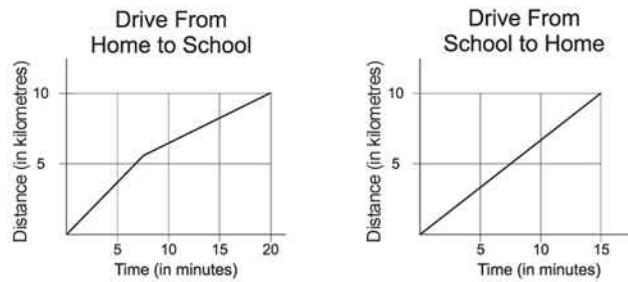
20. Which is the graph of  $y = -2(x - 1)^2 + 1$ ?



ANSWER ONLY

21. The two graphs below show Carol's drive from home to school and from school to home.

What is the difference in her average speed in kilometres per hour for the two trips?



- 5 kph
- 10 kph
- 15 kph
- 20 kph

22. The perimeter of a child's rectangular playground is 64 metres. The length and width of the playground are consecutive odd integers.

If the length ( $x$ ) is the longer of the two dimensions, what is the width of the playground?

- 15 metres
- 17 metres
- 31 meters
- 33 metres

**23.** The table below reflects the number of different handshakes ( $H$ ) for groups of  $n$  relatives.

For any size gathering of people, which formula gives the correct number of handshakes for  $n$  people?

$n$	7	8	12	20
$H$	21	28	66	190

$H = \frac{n(n+1)}{2}$

$H = \frac{(n-1)^2}{2}$

$H = \frac{n(n-1)}{2}$

$H = \frac{n^2+1}{2}$

**24.** Triangles  $ABC$  and  $DEF$  are similar. The lengths of the sides of  $\triangle DEF$  are 3 times the lengths of the corresponding sides of  $\triangle ABC$ .

How do the areas of the triangles compare?

The area of  $\triangle DEF$  is 3 times the area of  $\triangle ABC$ .

The area of  $\triangle DEF$  is 4 times the area of  $\triangle ABC$ .

The area of  $\triangle DEF$  is 6 times the area of  $\triangle ABC$ .

The area of  $\triangle DEF$  is 9 times the area of  $\triangle ABC$ .

**25.** Samantha tosses two 20c coins and three 10c coins.

What is the probability that both 20c coins and at least one of the 10c coins will land heads up?

$\frac{1}{32}$

$\frac{3}{32}$

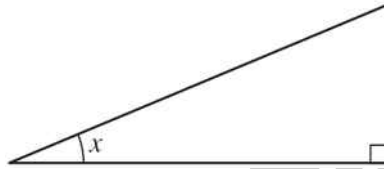
$\frac{7}{32}$

$\frac{21}{32}$

26. Which pair of equations shares a solution?

- $5x + 2 = 32$   
 $2x + 3 = 8 + x$
- $5x + 2 = 32$   
 $-3x + 4 = 2(x - 5)$
- $5x + 2 = 32$   
 $x + 2(x - 4) = 34 - 3x$
- $5x + 2 = 32$   
 $4x + 9 = 5(14 - x) - 7$

27. In the figure below, if  $\sin x = \frac{5}{13}$ , what are  $\cos x$  and  $\tan x$ ?



- $\cos x = \frac{12}{13}$  and  $\tan x = \frac{5}{12}$
- $\cos x = \frac{12}{13}$  and  $\tan x = \frac{12}{5}$
- $\cos x = \frac{13}{12}$  and  $\tan x = \frac{5}{12}$
- $\cos x = \frac{13}{12}$  and  $\tan x = \frac{13}{5}$

28. If  $\angle QRS$  and  $\angle XYZ$  are complementary, which must be **TRUE**?

- One of the angles can measure between  $90^\circ$  and  $180^\circ$ .
- The sum of the measures of the angles is  $90^\circ$ .
- The sum of the measures of the angles is  $180^\circ$ .
- Both angles must measure more than  $90^\circ$ .



29.  $(4x^2 - 2x + 8) - (x^2 + 3x - 2) =$

- $3x^2 + x + 6$
- $3x^2 + x + 10$
- $3x^2 - 5x + 6$
- $3x^2 - 5x + 10$

30. The Year 11 Dean at your school recorded the number of daily absences for a year, to look for a pattern.

Write a suitable question that the Dean could ask to investigate the pattern of student absences.

---

---

31. Kawarau has an annual rainfall of 110mm. In one week, the rainfall was 7mm.

What percentage of the annual rainfall is this?

\_\_\_\_\_ %

32. Ticket sales at the First Run Theatre total at least \$7,600 per week. An adult's ticket costs \$7.50 and a child's ticket costs \$4.00. If  $a$  represents the number of adult tickets sold in a week and  $c$  represents the number of child tickets, which algebraic sentence represents the money received each week from ticket sales?

- $7.50a + 4.00c = 7600$
- $7.50a + 4.00c \geq 7600$
- $7.50a + 4.00c > 7600$
- $7.50a + 4.00c < 7600$

**33.** Two linear equations are given below.

$$2x - 3y = 12$$

$$-4x + 6y = 6$$

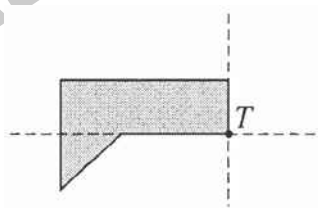
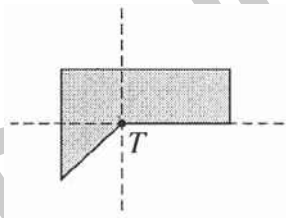
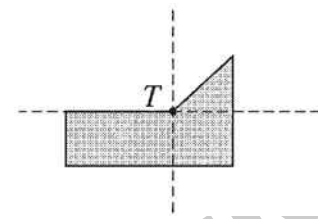
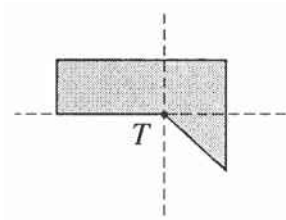
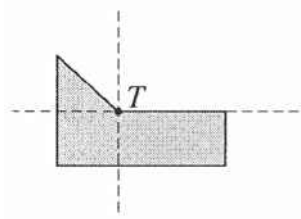
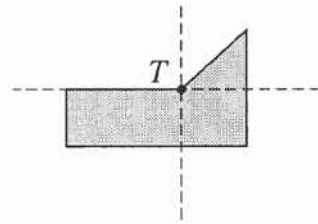
Which of the following statements about the equations is **TRUE**?

- They represent the same line.
- They represent lines with negative slopes.
- They represent parallel lines.
- They represent perpendicular lines.

ADMINISTER ONSCREEN  
ONLY

34. A half-turn around point  $T$  followed by a reflection in the horizontal axis is applied to the shaded figure.

Which of these shows the result of the combined transformation?



35. The sonar system of a submarine receives an echo back from a ship 5000 metres away after 6.1 seconds. It picks up an echo from a second ship after 8.4 seconds. Which proportion **could** be used to find the distance to the second ship?

- $\frac{6.1}{5000} = \frac{8.4}{x}$
- $\frac{6.1}{8.4} = \frac{x}{5000}$
- $\frac{8.4 - 6.1}{8.4} = \frac{x}{5000}$
- $\frac{2.3}{5000} = \frac{6.1}{x}$

Use the following information to answer question 36..

A sports scientist is interested in the importance of mass, muscle bulk and strength.

The scientist asked 12 students to conduct a fitness test.

The results were as follows.

Mass (kg)	Circumference of biceps (cm)	Lift test (kg)
52	22	48
57	24	52
62	28	51
59	26	55
62	31	54
64	30	60
73	34	58
76	28	57
84	35	63
78	33	60
80	34	61
82	36	62

36. He said. "Students with greater mass can lift more".

What would be the **BEST** graph to draw to see if the sports scientist is correct?

\_\_\_\_\_

End of Section

37. The formula shown below can be used to convert  $C$ , the temperature in degrees Celsius, to  $F$ , the temperature in degrees Fahrenheit.

$$F = \frac{9}{5}C + 32$$

Based on this information, which of the following statements is **TRUE**?

- A 9-degree increase in  $C$  results in a 32-degree increase in  $F$ .
- A 5-degree increase in  $C$  results in a 32-degree increase in  $F$ .
- A 5-degree increase in  $C$  results in a 9-degree increase in  $F$ .
- A 9-degree increase in  $C$  results in a 5-degree increase in  $F$ .

38. If  $x$  is a real number, for what value of  $x$  is the equation  $\frac{3x-9}{3} = x - 3$  true?

- All values of  $x$
- Some values of  $x$
- No values of  $x$
- Impossible to determine

39. For the graph of  $y = -(x - 2)^2 + 4$ , the axis of symmetry is

- $x = 4$
- $y = 2$
- $x = 2$
- $x = -2$
- $y = 4$

**40.** Juan has a bag containing 3 red, 2 blue, and 5 green marbles. He removes one marble from the bag, sets it aside, and draws another marble.

What is the probability that he draws a red marble followed by a blue marble?

- $\frac{2}{9}$
- $\frac{2}{10}$
- $\frac{3}{10}$
- $\frac{1}{15}$

**41.** In the  $xy$ -plane, a line parallel to the  $x$ -axis intersects the  $y$ -axis at the point  $(0, 4)$ . This line also intersects a circle in two points. The circle has a radius of 5 and its centre is at the origin.

What are the coordinates of the two points of intersection?

- $(1, 2)$  and  $(2, 1)$
- $(2, 1)$  and  $(2, -1)$
- $(3, 4)$  and  $(3, -4)$
- $(3, 4)$  and  $(-3, 4)$
- $(5, 0)$  and  $(-5, 0)$

ADMINISTER UNSCREEN ONLY

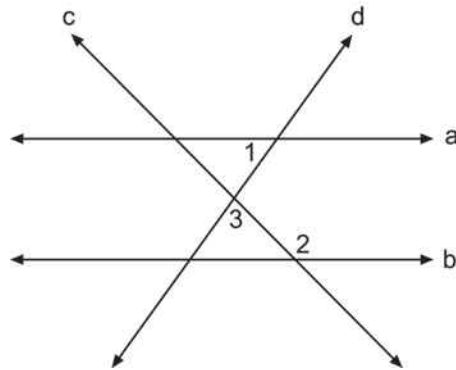
42. The diagram below has the following properties:

Line  $a$  is parallel to line  $b$ .

$$m\angle 1 = 62^\circ.$$

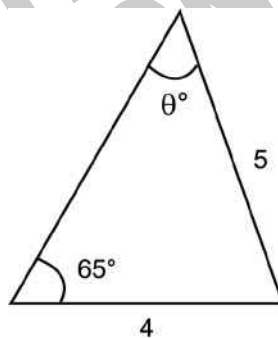
$$m\angle 2 = 122^\circ.$$

What is  $m\angle 3$ ?



- $56^\circ$
- $58^\circ$
- $60^\circ$
- $62^\circ$

43. Which statement is **TRUE** for the given triangle?



- $\sin \theta = \frac{4 \sin 65}{5}$
- $\sin \theta = \frac{5 \sin 65}{4}$
- $\sin \theta = \frac{4}{5 \sin 65}$
- $\sin \theta = \frac{4}{4 \sin 65}$

Use the following information to answer questions 44 to 46

The minimum wage increased from \$5.25 to \$5.75 per hour.

44. What is the percentage increase of the minimum wage?

---

45. Kevin was earning \$6.35 per hour at the time of the minimum wage increase. His employer raised his salary to \$7.10 per hour.

Did his manager give him an increase comparable to the rate of increase given the minimum wage earners?

Explain your reasoning.

---

---

---

---

---

46. Allana, who also works for the same employer, was promised a raise.

If she is making \$7.40 per hour, what new hourly wage would reflect an increase comparable to that received by the minimum wage earners?

---

---

---

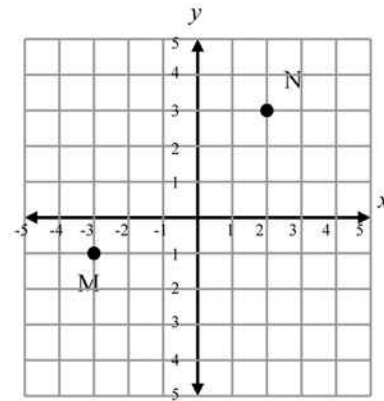
End of Section

47. Calculate  $\frac{\sqrt{96.4 + 68.1}}{(5.1 - 2.7)^2}$  rounding sensibly.

---

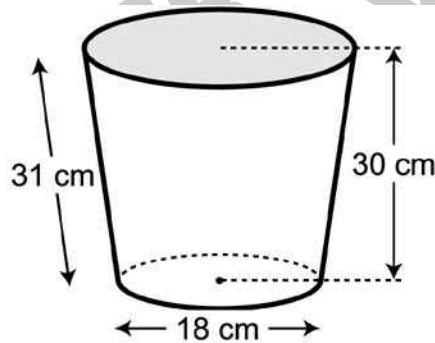


48. What is the distance between points M (-3, -1) and N (2, 3) on the graph below?



- $\sqrt{5}$
- $\sqrt{17}$
- $\sqrt{41}$
- $\sqrt{45}$

49. A bucket, in the shape of a truncated cone, has the dimensions shown. Which is the correct calculation for the diameter of the lid of the bucket?



- $2(\sqrt{31^2 - 30^2} + 9)$
- $2(\sqrt{31^2 + 30^2} + 9)$
- $2(\sqrt{31^2 - 30^2} - 9)$
- $2(\sqrt{31^2 + 30^2} - 9)$