TOPIC 9
Numeracy 2

9.1 Overview

Numerous **videos** and **interactivities** are embedded just where you need them, at the point of learning, in your learnON title at www.jacplus.com.au. They will help you to learn the concepts covered in this topic.

9.1.1 Why learn this?

Our lives are interwoven with mathematics. Counting, measuring and pattern-making are all part of everyday life. We use numbers to mark significant events (such as birthdays) and for identification (such as passports and credit cards). We use numbers to describe ourselves (for example our height and weight). Shopping involves understanding numbers, and tallying scores in sports requires a comparison of numbers. You may not realise just how much you rely on numbers.

9.1.2 What do you know?

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1. **THINK** List what you know about numeracy. Use a thinking tool such as a concept map to show your list.
2. **PAIR** Share what you know with a partner, then with a small group.
3. **SHARE** As a class, create a thinking tool such as a large concept map that shows your class's knowledge of numeracy.

LEARNING SEQUENCE

9.1 Overview
9.2 Set C
9.3 Set D

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9.2 Set C

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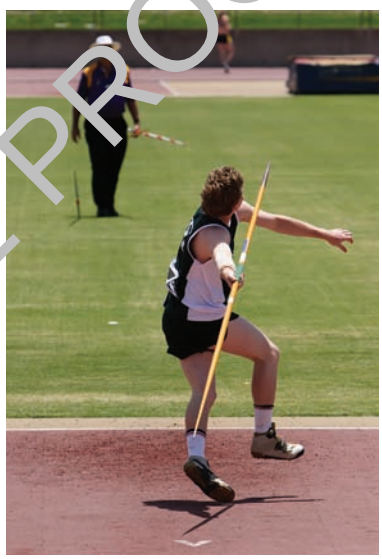
9.2.1 Calculator allowed

1. The cube root of 64 is between:
A. 1^2 and 1^3 **B.** 1^2 and 3^2 **C.** 2^3 and 4^2 **D.** 3^2 and 4^2

2. A javelin is thrown 3 times. The mean distance of the 3 throws is 55 m. The fourth throw reaches 63 m. What is the mean distance after 4 throws?
A. 52 m **B.** 57 m
C. 55 m **D.** 60 m



3. The monthly cost (C) of renting a mobile phone is given by the equation $C = 20 + 0.2x$, where x is the call time in minutes. If February's bill was $120, the call time was:
A. 300 minutes **B.** 100 minutes
C. 500 minutes **D.** 450 minutes

4. A music store has two promotions running at the same time:
- Buy 2 CDs for $26.95 each and get the third free
- 30% off all CDs which normally retail at $24.95 each.

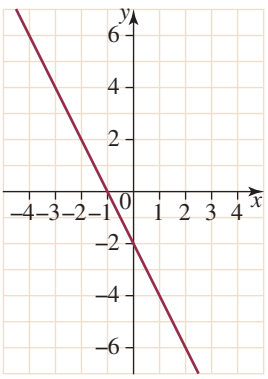
If Emma wants to buy three CDs, what is the best price she can get?
A. $53.90 **B.** $52.40
C. $51.90 **D.** $54.50

5. A number is multiplied by 3, then 12 is subtracted. The final answer is the square of 6. What is the original number?

6. A painter quotes $448 to paint the walls of a bedroom with the following dimensions:
length = 4 m
width = 3 m
height = 3.2 m
How much extra will he charge to paint the ceiling as well (at the same original cost per square metre)?
A. $100 **B.** $110
C. $120 **D.** $150

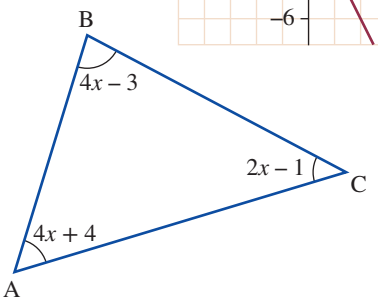
7. Solve the equation for q.
$$\frac{3-4q}{2} = \frac{1}{4}$$

8. What is the equation of the graph shown?



A. $y = -2x - 2$ **B.** $y = 2x - 2$
C. $y = -2x + 2$ **D.** $y = 2x + 2$

9. For the triangle shown, x equals:



A. 16
B. 17
C. 18
D. 19

10. The scale 200 cm ⇔ 4 m simplifies to the ratio:

A. 1 : 2 **B.** 1 : 4 **C.** 2 : 4 **D.** 50 : 1

11. A house is bought for $450 000 and sold for $525 000. Express the profit as a percentage of the cost price. (Round to 2 decimal places.)

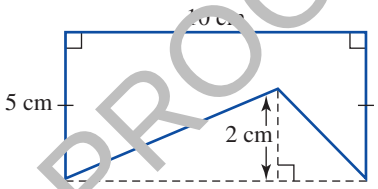
A. 14.29% **B.** 16.67% **C.** 85.71% **D.** 16.7%

12. A 300-g block of chocolate is to be broken into its individual squares. What is the mass of 4 squares of chocolate?

A. 10 g **B.** 16 g

C. 5 g **D.** 20 g

13. The area of the composite shape shown is:



A. 30 cm^2

B. 40 cm^2

C. 50 cm^2

D. 45 cm^2

14. What is the next term in the following pattern?

1, 4, 9, 16, . . .

A. 20 **B.** 25

C. 29 **D.** 36

15. A cyclist travels 15 km in 30 minutes. The speed (in km/h) she is travelling is:

A. 40 km/h **B.** 60 km/h

C. 80 km/h **D.** 30 km/h

16. The intersection point for $y = 2x + 4$ and $x + y = 1$ is:

A. $(-2, 1)$ **B.** $(-1, -2)$

C. $(-1, 2)$ **D.** $(2, 1)$

17. The factorised form of $2x^2y^3 - 6xy^2$ is:

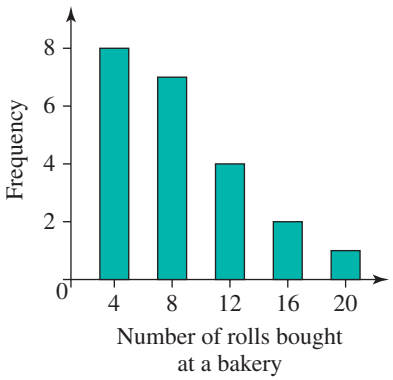
A. $2xy^2(xy - 3)$

B. $2xy(x^2y - 3)$

C. $2xy(xy - 6)$

D. $2x^2y(xy - 3)$

18. The graph shows the frequency of the number of bread rolls bought at a bakery. What is the total number of rolls bought?



A. 200

B. 188

C. 150

D. 168

19. What are the mean and median of the data shown in the table?

Score (x)	Frequency
1	1
2	2
3	3
4	4

A. The mean is 3 and median is 4. **B.** The mean is 3 and median is 3.

C. The mean is 4 and median is 3. **D.** The mean is 4 and median is 4.

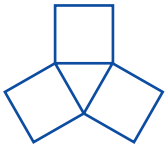
20. Which number is exactly halfway between 3.25 and 4.75?

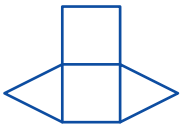
A. 3.95 **B.** 4.15 **C.** 4.25 **D.** 4

21. Write a fraction equivalent to 0.75.

22. Which diagram is the net of a square-based pyramid?

A. 

B. 

C. 

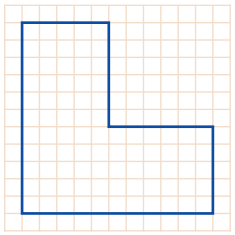
D. 

23. The table summarises how much time Lian spent on her Maths project.
What was the average amount of time each day Lian worked on her project?

A. 25 minutes
B. 30 minutes
C. 43 minutes
D. 1 hour

Time spent on project	
Day	**Time**
Monday	30 minutes
Tuesday	15 minutes
Wednesday	$1\frac{1}{4}$ hours
Thursday	50 minutes
Friday	45 minutes

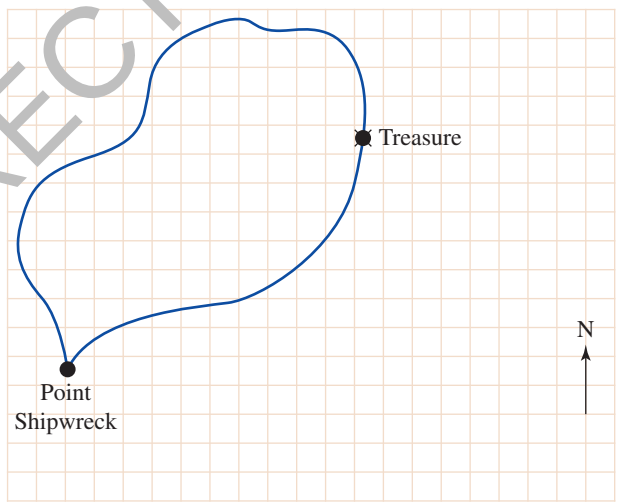
24. Draw a line of symmetry through the diagram.



25. If $x = -2$, what is the value of $\frac{2x}{3x - 2}$?

A. $\frac{1}{2}$ **B.** $\frac{1}{4}$ **C.** $\frac{2}{3}$ **D.** $\frac{1}{3}$

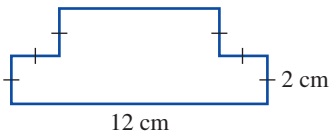
26. A map of Fern Island is shown below.



What direction is the treasure from Point Shipwreck?

27. The shape at right is to be enlarged by a factor of 3.
The new area will be:

A. 3 times the original area
B. 6 times the original area
C. 9 times the original area
D. 12 times the original area



28. Complete the table of values for the rule $y = 3x^2$.

x	−3	−2	−1	0	1	2	3
y							

29. The population of a city is expected to increase by 2.5% each year for the next 5 years. If this city's current population is 300 000, what is it expected to be in 5 years' time?

A. 339 422 **B.** 755 000 **C.** 3 750 345 **D.** 355 406

30. Find the area of material (m^2) needed to make a circular cushion with a diameter of 110 cm.
Note: Two pieces of material are cut out and sewn together to make the cushion.

A. 2.5 m^2 **B.** 2.0 m^2 **C.** 1.9 m^2 **D.** 1.5 m^2

9.3 Set D

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9.3.1 Non-calculator

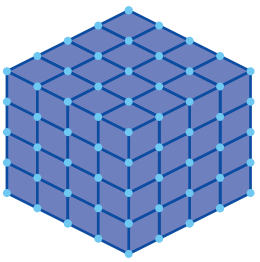
1. What is the equivalent fraction to $3\frac{2}{5}$?

A. $\frac{17}{3}$ **B.** $\frac{11}{5}$ **C.** $\frac{17}{5}$ **D.** $\frac{11}{2}$

2. The value of $\left[\left(\frac{1}{2}\right)^2 + 2\frac{1}{4}\right] \div \frac{5}{7}$ is:

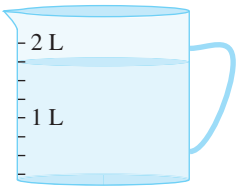
A. $\frac{25}{14}$ **B.** $3\frac{1}{2}$ **C.** $4\frac{1}{2}$ **D.** $2\frac{1}{3}$

3. A large cube, shown at right, is painted blue. How many cubes, inside this large cube, have no painted faces?



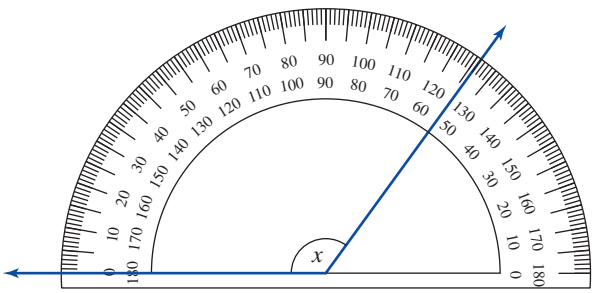
A. 8
B. 16
C. 36
D. 64

4. A glass of water (250 mL) is poured from the jug. How much water is left in the jug?



A. 1.75 L
B. 1.5 L
C. 1.25 L
D. 1 L

5. Measure the size of the unknown angle, x, using the protractor.



A. 125° **B.** 66° **C.** 54° **D.** 126°

6. 14.076 − 9.25 equals:

A. 4.826 **B.** 4.51 **C.** 4.926 **D.** 0.482

7. Jake recorded his classmates' preferred ice-cream flavours in the table below.

Ice-cream flavour	Number of students
Chocolate	14
Vanilla	3
Strawberry	7
Choc-mint	6

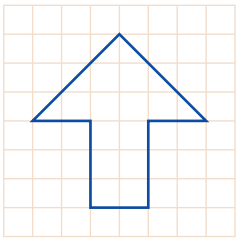
What percentage of students prefers choc-mint flavoured ice-cream?

A. 60% **B.** 20% **C.** 6% **D.** 25%

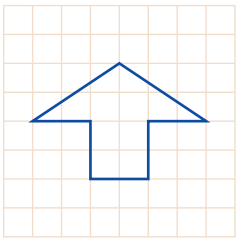
8. A car travels at 75 kilometres per hour. How far will it travel in 4 hours?

A. 300 km **B.** 150 km **C.** 100 km **D.** 250 km

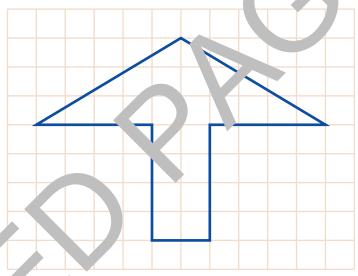
9. Which of the following diagrams shows the arrow below multiplied by a scale factor of $\frac{1}{2}$?



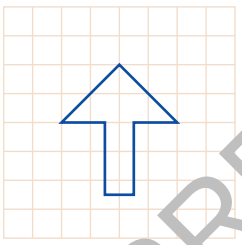
A.



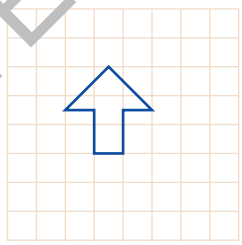
B.



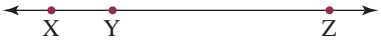
C.



D.

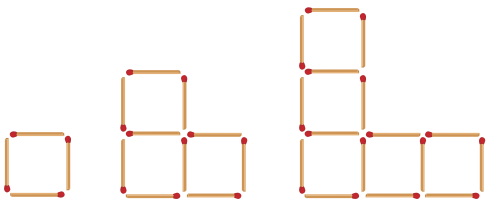


10. $\overline{XZ}$ is 32 cm. $\overline{XY}$ is a quarter of the distance of $\overline{XZ}$. Find $\overline{YZ}$.



A. 8 cm **B.** 16 cm **C.** 20 cm **D.** 24 cm

11. How many sticks would be needed to make the 5th shape in this pattern?

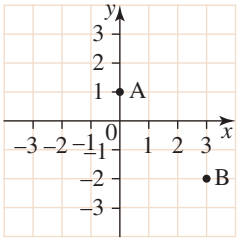


A. 10
B. 16
C. 28
D. 34

12. To convert from degrees Fahrenheit (°F) to degrees Celsius (°C), the following formula is used:
$C = \frac{5}{9}(F - 32)$.
What is the Fahrenheit temperature equivalent to 35 °C?

A. 86 °F **B.** 95 °F **C.** 70 °F **D.** 100 °F

13. The two points A and B are on which line?



A. $y = 1 - x$
B. $y = x + 1$
C. $y = x - 1$
D. $y = 3 - x$

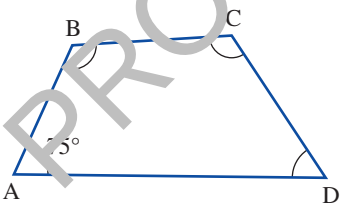
14. Solve the equation $\frac{4m}{5} + 7 = 11$.

A. $m = 5$ **B.** $m = 4$
C. $m = -5$ **D.** $m = 2$

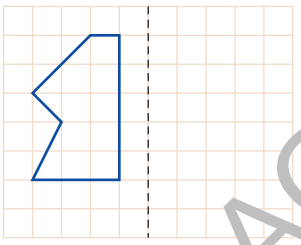
15. A football team played 22 games during a season. The team won 4 more games than it lost. How many games did the team win?

A. 9 **B.** 11 **C.** 13 **D.** 14

16. ∠BAD and ∠BCD are supplementary angles. ∠ABC is 130°. Find the size of ∠ADC.



17. Draw the reflection of the shape shown below.



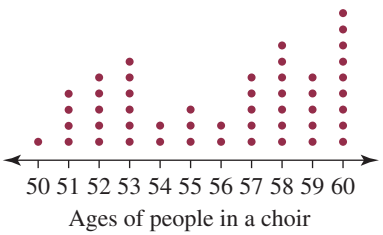
18. If $p = 3$ and $q = -5$, evaluate $q^2 - 2p$.

A. -31 **B.** -19 **C.** 21 **D.** 19

19. The area of a circle is $A = \pi r^2$. Which value best estimates the area of a circle with a radius of 5 cm?

A. 75 cm^2 **B.** 15 cm^2 **C.** 50 cm^2 **D.** 7.5 cm^2

20. This dot plot shows the ages of people in a choir. What is the most common age of the choir members?



A. 50 **B.** 58
C. 59 **D.** 60

21. What is the probability of getting Tails when a fair coin is tossed?

A. 0 **B.** $\frac{1}{2}$
C. 1 **D.** $\frac{1}{3}$

22. Insert '<' or '>' to make this statement true.
4^3 __ 2^5

23. The following scores were recorded in a test: $\frac{18}{20}$ and 88%. Which is the higher score?

24. The cost of two different books is in the ratio 4 : 5. If the more expensive book costs $25, what does the cheaper book cost?

A. $5 **B.** $10
C. $15 **D.** $20

25. Calculate the value of 3 m 75 cm + 5 m 36 cm.

A. 8 m 95 cm **B.** 9 m 11 cm
C. 9 m 20 cm **D.** 8 m 11 cm

26. There are 60 squares in a chocolate block. If Stef eats $\frac{2}{3}$ of the block, how many squares are left?

A. 30 **B.** 25 **C.** 20 **D.** 15

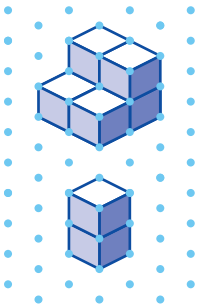
27. The length of a rectangular sporting field is four times its width. If the perimeter of the field is 200 m, find the length and width.

28. A bag of marbles contains 22 red, 20 yellow, 15 green and 18 blue marbles. Darcy chooses one marble without looking. What is the chance it will be green?

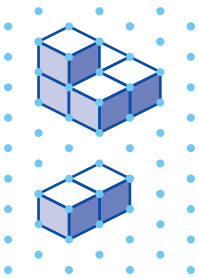
A. $\frac{1}{3}$ **B.** $\frac{1}{4}$ **C.** $\frac{1}{5}$ **D.** $\frac{1}{6}$

29. Which pair of shapes fits together to make a cube?

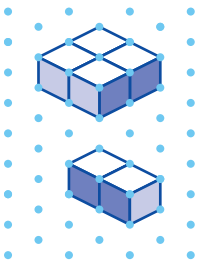
A.



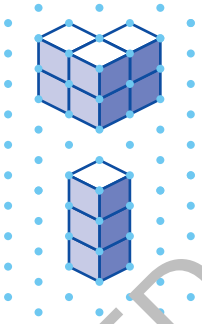
B.



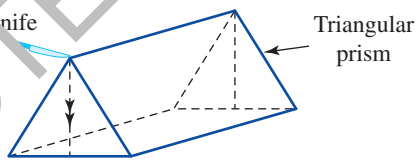
C.



D.



30. What shape is revealed when a triangular prism is cut vertically?



A. Triangle **B.** Square **C.** Rectangle **D.** Trapezium

Answers

Topic 9 Numeracy 2

Exercise 9.2 Set C

9.2.1 Calculator allowed

1. B **2.** B **3.** C **4.** B

5. 16 **6.** C **7.** $q = \frac{5}{8}$ **8.** A

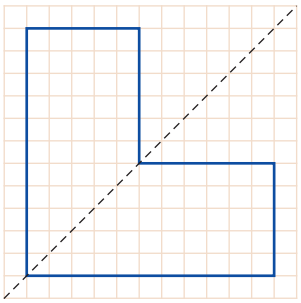
9. C **10.** A **11.** B **12.** D

13. B **14.** B **15.** D **16.** C

17. A **18.** B **19.** B **20.** D

21. $\frac{3}{4}$ **22.** D **23.** C

24.



25. A **26.** North-east **27.** C

28. 27, 12, 3, 0, 3, 12, 27 **29.** A **30.** C

Exercise 9.3 Set D

9.3.1 Non-calculator

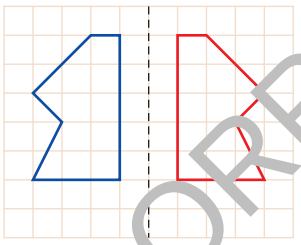
1. C **2.** B **3.** A **4.** B

5. D **6.** A **7.** B **8.** A

9. D **10.** D **11.** C **12.** B

13. A **14.** A **15.** C **16.** 50°

17.



18. D **19.** A **20.** D **21.** B

22. > **23.** $\frac{18}{20}$ **24.** D **25.** B

26. C **27.** $l = 80$ m $w = 20$ m **28.** C

29. A **30.** C