Chapter 1 *Directed Number*
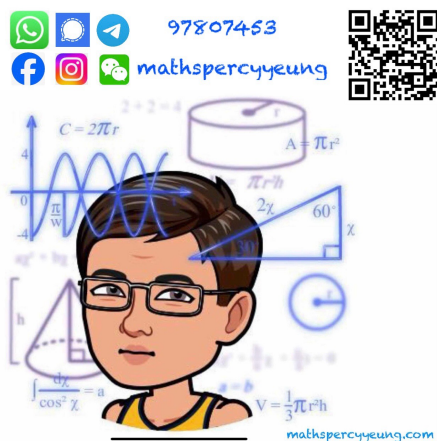
Multiple Choice Section

1. Which one of the following is a negative integer?

   A. -5 B. $-\dfrac{5}{6}$ C. 0 D. 5

2. Which one of the following numbers is less than -10?

   A. -11 B. -10 C. 0 D. 10

3. Arrange the following numbers in ascending order.

   $0, -1, 2, -3$

   A. $2 < 0 < -1 < -3$

   B. $0 < -1 < -3 < 2$

   C. $0 < -1 < 2 < -3$

   D. $-3 < -1 < 0 < 2$

4. Find the largest number in $\dfrac{2}{3}$, $\dfrac{3}{4}$, $\dfrac{7}{8}$, $\dfrac{4}{5}$ and $\dfrac{1}{2}$.

   A. $\dfrac{2}{3}$ B. $\dfrac{7}{8}$ C. $\dfrac{4}{5}$ D. $\dfrac{1}{2}$

5. Which one of the following must be correct?

   A. $-5 > 0$ B. $0 < -2$ C. $-3 > 0$ D. $0 < +4$

6. Evaluate $-9 + 3$.
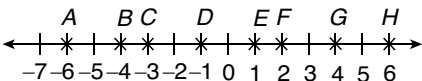
   A. -3 B. -6 C. -12 D. $+6$

7. Evaluate $(-7) + (+23)$.

   A. $+30$ B. $+16$ C. $+14$ D. -16

8. Evaluate $(-13) - (+8)$.

   A. $+21$ B. $+5$ C. -21 D. -15

9. Evaluate $[(-10) + (-2)] - (-9)$.

    A. -12 B. -9 C. -3 D. $+1$

10. Evaluate $-[-4 + (-\frac{1}{2} + \frac{1}{3})]$.

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

11. Evaluate $(-9)(-1)$.

    A. $+10$ B. $+9$ C. -8 D. -9

12. Evaluate $(+18) \div (-18)$.

    A. $+18$ B. $+1$ C. 0 D. -1

13. Evaluate $(+5) \div (+\frac{1}{2})$.

    A. $+10$ B. $+5\frac{1}{2}$ C. $-5\frac{1}{2}$ D. -10

14. Evaluate $(-1)(+1)(-1)(+1)$.

    A. $+4$ B. $+1$ C. 0 D. -1

15. Evaluate $(-24) \div (-\frac{2}{3}) \times (-\frac{3}{4}) \times (+6)$.

    A. $+216$ B. $+162$ C. -162 D. -216

16. Evaluate $(-3) \times [(-4) - (-5)]$.

    A. $+60$ B. $+27$ C. -3 D. -27

17. Evaluate $\dfrac{(+2) - (+6)}{(-3) - (-7)}$.

    A. $-\frac{4}{5}$ B. $-\frac{2}{5}$ C. -1 D. $+1$

18. Evaluate $-(-4) - [(+5) + (-6)]$.

    A. $+15$ B. $+5$ C. $+3$ D. -3

19. Evaluate $(-1)^{73} \times (-1)^{11}$.

    A. -2 B. -1 C. $+1$ D. $+2$

20. Evaluate $-3^2 + (-1)^2 \times (-4)^2 \div (-2)^2$.

    A. $+17$ B. $+9$ C. -5 D. -17

21. If +\$20 represents \$20 profit, then $-\$15$ represents

    A. \$15 profit.   B. +\$15 profit.

    C. \$15 loss.   D. $-\$15$ loss.

22. Suppose +1 m represents ascending by 1 m. Use positive or negative numbers to represent the following situations.

A plane descends by 1 m and then descends by 1 m.

    A. +1 m, +1 m   B. -1 m, +1 m

    C. -1 m, 0 m   D. -1 m, -1 m

23. Given that +\$1 represents depositing \$1 into the bank, write down the following changes in account using directed numbers.

Miss Lee deposits \$1 700, then deposits \$180.

    A. +\$1 700, +\$180   B. \$1 700, \$180

    C. $-\$1$ 700, +\$180   D. +\$1 700, $-\$180$

24. On a certain day, the temperature fell from 4ºC to -2ºC. Find the temperature change on that day.

    A. +6ºC   B. +2ºC   C. -2ºC   D. -6ºC

25. A metal cup with temperature 16ºC is put into the freezer, and the temperature drops by 24ºC. Find the final temperature of the metal cup.

    A. -24ºC   B. -16ºC   C. -8ºC   D. 8ºC

26. Find the distance between *A* and *C*.

    A. $+6$ B. $+3$ C. -3 D. -6

27. The temperature at a certain place fell 3°C in the first day, fell 4°C in the second day, fell 5°C in the third day and rose 6°C in the fourth day.
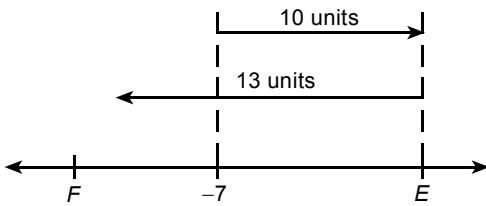
Find the overall change in the temperature at that place.

   A. −18 °C   B. −6 °C   C. −4 °C   D. +4 °C

28. Paul's pocket money has increased by $320 in January, decreased by $400 in March, and increased by $100 in June. Find the final change in his pocket money.

   A. Decreased by $820   B. Decreased by $180

   C. Increased by $20   D. Increased by $820

29. According to the diagram, find the values of E and F.

   A. $E = 3, F = −10$ B. $E = 10, F = −13$

   C. $E = 10, F = −3$ D. $E = −13, F = 10$

30. Which of the following is the correct order for calculating $(−9) + (−1) \times (−10)$?

   A. Do multiplication first, then do subtraction.

   B. Do addition first, then do multiplication.

   C. Do subtraction first, then do multiplication.

   D. Do multiplication first, then do addition.

31. An athlete starts at the basement B1, runs up to the 1st floor, then runs down to the basement B2, and finishes at the 2nd floor. How many storeys does he run?

   A. 9   B. 6   C. 5   D. 3

32. The average mark of a Mathematics test of students in F.1B is 82. Using the following table, how many marks does Vivian get above the mark Claudia got?

Name	Albert	Vivian	Kevin	Sally	Gary	Elaine	Claudia
Mark	70	86	88	90			
Marks above the average mark					+ 6	− 10	− 2

   A. −6 marks   B. −2 marks   C. +2 marks   D. +6 marks

33. In a competition, winning a game gains 10 points, losing a game loses 15 points and forfeiting a game loses 5 points. If Ivan has won 4 games, lost 3 games and forfeited 3 games in the competition, how many points would he get?

   A. +40 points   B. +20 points   C. −20 points   D. +5 points

34. The rules of a dart game are as follows:
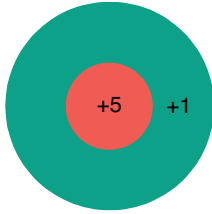
Hitting the bull's eye of the target gains 5 points; hitting the green region of the target gains 1 point; missing the target loses 3 points.

If Steven threw 10 darts, 3 of them missed the target and 4 of them hit the bull's eye, how many points would he get?

   A. +1 point   B. +3 points   C. +6 points   D. +14 points

Section A(1)

1. Use directed numbers to represent the following situations.

   (a) 6°C below zero   **(b)** A loss of $10 000

2. Fill in the blanks with suitable symbols. (> or <)

   (a) 10_____−5   **(b)** −3_____7   **(c)** −5_____−9   **(d)** −20_____−1

3. Arrange the following numbers in ascending order.

   $-2, 5, -1, 0, -\dfrac{1}{3}, 9$

4. Arrange the following numbers in descending order.

   $-0.3, 0.8, -0.7, 3, -3, -8, 8, -7$

5. Evaluate the following.

   (a) $8 + (-3)$ **(b)** $-8 + 3$ **(c)** $-8 + (-3)$

6. Evaluate the following.

(a) $4 - 20$ **(b)** $4 - (-20)$ **(c)** $-4 - 20$ **(d)** $-4 - (-20)$

7. Evaluate the following.

(a) -5×3 **(b)** $5 \times (-3)$ **(c)** $-5 \times (-3)$

8. Evaluate the following.

(a) $8 \div (-4)$ **(b)** $(-8) \div 4$ **(c)** $(-8) \div (-4)$

9. Evaluate the following.

(a) $(-3) - (-5) + (-6)$ **(b)** $(-8) + (-8) - (-8)$

10. Evaluate the following.

(a) $(-20) \div 4 \times (-6)$ **(b)** $(-5) \times (-5) \div (-5)$

11. Evaluate the following.

(a) $-5 + (-3) \times (-6)$ **(b)** $(-12) \div (-4) - 9$

12. Evaluate the following.

(a) $\dfrac{2}{3} + (-\dfrac{3}{4})$ **(b)** $-\dfrac{2}{3} + \dfrac{3}{4}$ **(c)** $-\dfrac{2}{3} + (-\dfrac{3}{4})$

13. Evaluate the following.

(a) $\dfrac{2}{5} - \dfrac{1}{2}$ **(b)** $-\dfrac{1}{3} - (-\dfrac{5}{6})$ **(c)** $-\dfrac{3}{8} - \dfrac{5}{12}$ **(d)** $-\dfrac{1}{6} + (-\dfrac{3}{4})$

14. Evaluate the following.

(a) $2\dfrac{3}{4} - 3\dfrac{1}{6}$ **(b)** $2\dfrac{3}{4} - (-3\dfrac{1}{6})$ **(c)** $-2\dfrac{3}{4} - 3\dfrac{1}{6}$ **(d)** $-2\dfrac{3}{4} - (-3\dfrac{1}{6})$

15. Evaluate the following.

(a) $\dfrac{1}{3} \times (-\dfrac{4}{5})$ **(b)** $-\dfrac{3}{5} \times \dfrac{4}{7}$ **(c)** $-\dfrac{8}{11} \times (-\dfrac{4}{3})$

16. Evaluate the following.

   (a) $1.5 - 2.4 + 3.6$ **(b)** $-1.5 - (-2.4) - 3.6$

17. Evaluate the following.

   (a) $(-3)^4$ **(b)** -2^4 **(c)** $(-4)^3$ **(d)** -5^3

18. Evaluate the following.

   (a) $-4 \times (-5)^2$ **(b)** $(-7)^2 \div (-7)$ **(c)** $-5^2 + (-6)^2$ **(d)** $(-5)^2 - (-6^2)$

19. Evaluate the following.

   (a) $(\dfrac{-5}{-6})^2$ **(b)** $\dfrac{-5^2}{(-6)^2}$

Section A(2)

20. Fill in the blanks with suitable symbols. (> or <)

   (a) $-\dfrac{1}{3}$ _____ $-\dfrac{1}{5}$ **(b)** -2.8 _____ -3.8 **(c)** -0.5 _____ $-\dfrac{1}{4}$

21. Arrange the following numbers in ascending order.

   $-2.4, -2.6, -\dfrac{16}{3}, -3, -\dfrac{1}{4}, -\dfrac{1}{7}$

22. Evaluate the following.

   (a) $2 + (-5) \times (-8) - 12 \div (-2)$ **(b)** $(4 - 8) \div (5 - 7) \times 2 - 30 \times (-5)$

23. Evaluate the following.

   (a) $\dfrac{2}{3} \times (-2\dfrac{1}{2}) + (-4) \div \dfrac{8}{5}$ **(b)** $-0.3 + (-8.4) \div [(-2.5) \times 4]$

24. Evaluate $(-3)^4 + (-2)^3 \times [3 \times (-5) + 11]^2$.

25. Evaluate the following.

(a) $3 - 2^4$

(b) $3 - 2^4 + (-5)^2 - 4 \times (-3)^2 - 6 \times 2^3$

26. Evaluate the following.

(a) $-[-(-\frac{1}{8})]$

(b) $[-\frac{2}{3} - \frac{5}{3} - (-\frac{4}{3})] \times (0 - \frac{1}{2}) - [-(-\frac{1}{8})]$

27. Evaluate the following.

(a) $\dfrac{-2}{0 + (-3)}$

(b) $-[\dfrac{-2}{0 + (-3)}] \times \dfrac{-3^2}{2} \div \dfrac{-3}{(-7)^2}$

28. (a) Evaluate the following.

(i) $(-5)^2 + 2(-5)(4) + 4^2$ **(ii)** $4^3 - (-2)^3 - 3(4)^2(-2) + 3(4)(-2)^2$

(b) Evaluate $\dfrac{(-5)^2 + 2(-5)(4) + 4^2}{4^3 - (-2)^3 - 3(4)^2(-2) + 3(4)(-2)^2}$.

29. Evaluate $2 - \dfrac{-2}{2 + \dfrac{-2}{2 - \dfrac{-2}{2 + 2}}}$.

30. A company had a profit of \$12 000 in the first month, a loss of \$14 000 in the second month, a loss of \$20 000 in the third month and a profit of \$8 000 in the fourth month. Use directed number to represent the net profit.

31. In a Mathematics competition, there are 10 questions of equal marks. You get 10 marks for a correct answer, lose 8 marks for a wrong answer, or no mark for each blank answer. If Jimmy answered 3 questions correctly, 6 questions wrongly, and left 1 question unanswered, how many marks could he get?

32. On a certain day, the temperatures of five cities were as follows:

City	Temperature (°C)
HKSAR	16
Melbourne	21
Chicago	−14
Berlin	−5
Zurich	−8

(a) Which city was the coldest on that day?

(b) Which city was the hottest on that day?

(c) Find the difference in temperature between the hottest and the coldest cities on that day.

33. A dolphin jumped from 1.5 m below the sea-level to 4 m above the sea-level. It touched a ball and then descended 7 m to the water.

(a) Find the distance between the dolphin and the ball initially.

(b) Use directed number to represent the distance between the dolphin and the sea-level finally.

34. A model plane was 50 m above a building initially and then descended 140 m.

(a) How far was it above the top of the building?

(b) If the model plane ascended 80 m afterwards,

    (i) how far was it above the top of the building?

    (ii) was it above or below the top of the building?

Section B

35. On a certain day, the temperatures of a city were recorded. They were recorded according to the differences between the temperatures of two consecutives hours.

Time	Change in temperature (°C)	Actual temperature (°C)
9:00 a.m.		−10
10:00 a.m.	+3	−7
11:00 a.m.	−2	
12:00 noon	+1	
1:00 p.m.	+2	−6
2:00 p.m.	0	
3:00 p.m.	+1	
4:00 p.m.	+0.5	−4.5
5:00 p.m.	−2	
6:00 p.m.	−4.5	

(a) Complete the above table.

(b) At what time the temperature was the lowest?

(c) Find the difference between the highest and the lowest temperatures from 9:00 a.m. to 6:00 p.m.