

**SKH St. Simon's Lui Ming Choi Secondary School**  
**Form 1 Mathematics Summer Homework**  
**Chapter 2 Directed Numbers and the Number Line**

Name: \_\_\_\_\_ Class: \_\_\_\_\_ ( ) Date: \_\_\_\_\_

1. In each of the following, use a directed number to represent the situation opposite to the given one.
- (a) -\$600 represents a decrease of \$600 in profit.  
 (b) +10 cm represents 10 cm to the east of a mailbox.

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2. In each of the following, write down the opposite number of the given number.

(a) -26                      (b)  $-\frac{4}{5}$

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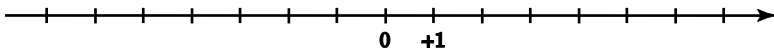


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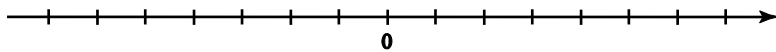
3. In each of the following, mark the number and its opposite number on the number line below.



(a) +2                                      (b) -5                                      (c) +7

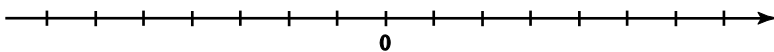
4. Use a number line to find the result of each of the following expressions.

(a)  $(+3) + (-9)$                       (b)  $(-2) + (+7)$



5. Use a number line to find the result of each of the following expressions.

(a)  $(-2) - (+5)$                       (b)  $(+3) - (+4)$



6. First remove the brackets, then evaluate the following expressions.

(a)  $(+6) + (-15)$

(b)  $(-2) + (-18)$

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7. Evaluate the following expressions.

(a)  $(-2) \times (+3) \times (+4)$

(b)  $(+8) \times (-1) \times (-7)$

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8. Represent each of the following word phrases by an expression and evaluate the expression.

(a) Multiply  $-3$  by  $+8$ .

(b) Add  $-3$  to the product of  $-2$  and  $+5$ .

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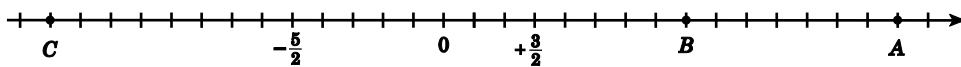
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9. \*\*Refer to the number line below.



(a) Write down the directed numbers represented by  $A$ ,  $B$  and  $C$ .

(b) How many integers are greater than  $C$  and smaller than  $B$ ?

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**SKH St. Simon's Lui Ming Choi Secondary School**  
**Form 1 Mathematics Summer Homework**  
**Chapter 4 Linear Equations in One Unknown**

Name: \_\_\_\_\_ Class: \_\_\_\_\_ ( ) Date: \_\_\_\_\_

Solve the following equations. (1-20):

1.  $2x + 1 = 5$

5.  $-7c = 21 - 4c$

2.  $3x + 2 = 23$

6.  $27 + 5x = -18 + 6x$

3.  $1 - 4x = 17$

7.  $3x - 6 = 2x + 9$

4.  $31 - \frac{3x}{4} = 19$

8.  $-7x + 12 = -9 - 4x$

9.  $x + 9 = 2(6 - x)$

13.  $\frac{1}{3}(2x - 1) = 5$

$$10. -2(7-11x)=8x$$

$$14. \frac{7-5z}{3} = -2z$$

$$11. 4(3x-3)=5x-19$$

$$15. \frac{7(3y+5)}{5} = -14$$

$$12. \frac{1}{6}x+1=\frac{5}{6}$$

$$16. \frac{3(x-2)}{7}+4=-20$$

$$*17. \frac{p}{3}-\frac{3p}{4}=5$$

$$*19. \frac{r-1}{9}=\frac{2r+1}{6}$$

\*18.  $\frac{x}{6} - 5 = -\frac{x}{9}$

\*20.  $\frac{4x+1}{3} = \frac{30-x}{2}$

21. When  $x$  is added to the product of 4 and  $x$ , the result is  $-10$ . Find the value of  $x$ .

22. Peter has 19 comic books and Daisy has 23 comic books. If Daisy gives some comic books to Peter, both of them will have the same number of comic books. How many books does Daisy give to Peter?

23. Peter has  $y$  candies. Daisy has 3 candies more than 2 times the candies Peter has. If the difference between the numbers of candies Peter and Daisy have is 17, find the value of  $y$ ?
24. Peter pays \$28 for 2 packs of Shanghai noodles and a pack of green tea noodles. Given that the price of a pack of green tea noodles is \$6, find the price of a pack of Shanghai noodles.
- \*25. Peter is 6 years older than Daisy. After 3 years, Peter will be twice as old as Daisy. Find Daisy's present age.







9. The sales of a certain laptop computer were 300 last month. The percentage change in the sales this month is +15% as compared to last month. Find the change in the sales.
10. Mr Poon bought 30 handbags for \$85 each and sold them for \$3 570.  
(a) Find the total profit.  
(b) Find the profit per cent.
11. A car agent bought two second hand cars and sold them for \$108 000 each. If there is a loss of \$24 000, what is the loss per cent in selling the second hand cars?
12. The marked price of a dinnerware set is \$600 and the selling price is \$420. Find  
(a) the discount  
(b) the discount per cent.
13. A calculator marked at \$300 is sold at a discount of 40% in a book fair. How much is saved in buying such a calculator?

14. A calculator marked at \$160 is sold at a discount of 15%. Find the discount.
15. A TV set marked at \$5 200 is sold at a discount of 30%. What is the selling price?
16. Last year, P6 students in a primary school participated in the Secondary School Places Allocation (SSPA) System, and 75% of them admitted to their first choice secondary school. If 153 students in the school admitted to their first choice secondary school, how many students in the school participated in the SSPA System?
17. In a town, 3% of electors are below the age of 21. Suppose 3 395 electors are 21 years old or above.
- (a) How many electors are there in the town?
  - (b) If 1 785 electors are female, find the percentage of female electors in the town.

18. Thomas's height increases by 5% to 168 cm this year. Find his height last year.
19. After a 36% discount, a pair of boots is sold for \$256. What is the marked price?
20. Amy, Belle and Chris plan to have a dinner buffet. It is given that the standard price of the buffet is \$480 per head.
- (a) On every Saturday, the price will be changed to \$600 per head. Find the percentage change in price.
  - (b) On every Monday, the percentage change in the price is  $-15\%$ . Find the total price if they have the buffet on a Monday.

21. \*\*In a fast food restaurant, the selling price of a sandwich is \$20 and the cost price of a can of coke is \$2.
- (a) Given that the profit per cent obtained by selling a sandwich is 150%, find the cost price of a sandwich.
  - (b) A sandwich set consists of a sandwich and a can of coke. If such a sandwich set is available for sale at a profit of 130%, find its selling price.
22. \*\*A merchant sold a monitor for \$1 680 and a printer for \$1 120. It is given that the monitor was sold at a loss of 30% and the printer was sold at a profit of 40%.
- (a) Find the cost prices of the monitor and the printer.
  - (b) On the whole, did he make a profit or loss? Explain your answer.
  - (c) Find the profit or loss per cent.

23. \*\*In shop *A*, the marked price of a toaster is \$360 and it is sold at 40% discount. In shop *B*, a customer can buy the same toaster at a discount of 20% and saves \$55. If Keith wants to buy the toaster at a lower price, which shop should he choose? Explain your answer.

24. \*\*A shopkeeper bought a packet of potato chips for \$10. Its marked price is 40% above its cost price. In a sale, the packet of potato chips is sold at a discount of 30%.

- (a) Find the marked price and selling price of the packet of potato chips.
- (b) Is there a profit or a loss? Explain your answer.
- (c) Find the profit or loss per cent.

**SKH St. Simon's Lui Ming Choi Secondary School**  
**Form 1 Mathematics Summer Homework**  
**Chapter 10 Manipulation of Simple Polynomials**

Name: \_\_\_\_\_ Class: \_\_\_\_\_ ( ) Date: \_\_\_\_\_

 **Key Points**

If both  $m$  and  $n$  are positive integers, then

$$a^m \times a^n = a^{m+n}$$

If  $a \neq 0$  and both  $m$  and  $n$  are positive integers, then

(i)  $a^m \div a^n = \frac{a^m}{a^n} = a^{m-n}$ , where  $m > n$

(ii)  $a^m \div a^n = \frac{a^m}{a^n} = \frac{1}{a^{n-m}}$ , where  $m < n$

1. Simplify the following expressions.

(a)  $(x^5)(x^3)$

(b)  $h^4 \times h^3$

(c)  $2t^6 \times 3t^4$

(d)  $(-2b^2)(-3b^3)$

(e)  $(4x^5)(3x^2)$

(f)  $(x^3y)(4xy^2)$

(g)  $(-3p^2q^3)(-5pq^4)$

(h)  $(4p^2q^5)(6p^7q^3)$

2. Simplify the following expressions.

(a)  $\frac{u^8}{u^6}$

(b)  $x^5 \div 2x^3$

(c)  $\frac{6y^2}{3y^6}$

(d)  $24x^4 \div 3x^2$

(e)  $8a^5 \div 2a^3$

(f)  $\frac{x^3y^4}{xy}$

(g)  $\frac{-27a^3b^4}{9ab^6}$

(h)  $\frac{100x^6y^6}{25x^4y^7}$

### Key Points

1. Arrangement of terms

e.g. Consider the polynomial  $3x - 4x^2 - 2x^3 + 5$ .

(i) Arranged in **descending powers** of  $x$ :  $-2x^3 - 4x^2 + 3x + 5$

(ii) Arranged in **ascending powers** of  $x$ :  $5 + 3x - 4x^2 - 2x^3$

Note: For a polynomial in two or more variables, its terms can also be arranged in descending powers or ascending powers of one of the variables.

e.g. Consider the polynomial  $2x^3y + xy^3 + 5x^2 - 3y^2$ .


(i) Arranged in descending powers of  $x$ :  $2x^3y + 5x^2 + xy^3 - 3y^2$

(ii) Arranged in descending powers of  $y$ :  $xy^3 - 3y^2 + 2x^3y + 5x^2$


2. Polynomials containing like terms can be simplified by adding or subtracting the coefficients of the like terms.

e.g.

(i)  $2x + 4x = 6x$



(ii)  $2a^2 - 4a^2 = -2a^2$



3. Arrange the following polynomials in ascending and descending powers of the variables.

(a)  $3x^2 - 2 + 7x + 8x^3$

(b)  $-4y + 5y^2 - 11 + 6y^4$



4. Simplify the following polynomials and arrange them in descending powers of the variables.

(a)  $-10 + 3x - 8x^2 + 7x + 6x^3 + 2$

(b)  $-9y^2 + 5y^4 - 6y^2 + 4y - 12y^4$

### Key Points

Addition and subtraction of polynomials can be performed by the following steps:

Step 1 Remove the brackets.

Step 2 Group the like terms.

Step 3 Combine the like terms.

5. Simplify the following expressions.

(a)  $(6x - 4y) + (7y - 10x)$

(b)  $(-2x + 8y - 2z) + (-8z + 10x)$

(c)  $(8a - 2b + 7c) + (-3b + 5a - 4c)$

(d)  $(-5x - 2y) - (2x - 11y)$

(e)  $(6x + 2y) - (3x - 7y + 4z)$

(f)  $(5x - 7y - 10z) - (-2x + z - 6y)$

6. Simplify the following expressions.

(a)  $(3x^2 - 6x + 7) + (4x - 8x^2)$

(b)  $(6x^2 + 2x - 3) + (3x - 4x^2 + 7)$

(c)  $(4y^2 + 6y - 7) + (-4 - 2y - 3y^2)$

(d)  $(-7x^2 - 8x) - (3 + 6x - 9x^2)$

(e)  $(-2y^2 + 3y - 7) - (10 - 6y - 11y^2)$

(f)  $(2x^2 + 7x - 1) - (-6 - 8x^2 + 3x)$

### Key Points

Multiplication of polynomials can be performed by applying the **distributive law of multiplication**:

$$\overbrace{a(x+y)} = ax + ay \quad \text{或} \quad \overbrace{(x+y)a} = xa + ya$$

Multiplication of binomials and polynomials can be done by applying the distributive law of multiplication repeatedly as follows:

$$(a+b)(x+y) = \overbrace{(a+b)x} + \overbrace{(a+b)y} = ax + bx + ay + by$$

$$\text{or } (a+b)(x+y) = \overbrace{a(x+y)} + \overbrace{b(x+y)} = ax + ay + bx + by$$

7. Expand the following expressions.

(a)  $6(3x - 2y)$

(b)  $3x(5x - 2)$

(c)  $-4y(-4y^2 + 2y - 5)$

(d)  $(3x - 2y)(5x)$

(e)  $(9x^2 - 8x - 4)(5x)$

(f)  $(-11x^2 + 3x + 6)(-7x)$

8. Expand the following expressions.

(a)  $(4x - 7)(2x - 5)$

(b)  $(2x - 9y)(3x + 5y)$

(c)  $(4x - 7y)(-6x + 5y)$

(d)  $-(3t + 4v)(2t - v)$

(e)  $** (2x^2 - 3x + 4)(3x - 2)$

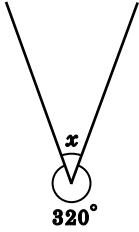
(f)  $** (4x^2 - 3)(2x^3 - 5x - 1)$

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**Chapter 11 Angles related to Lines**

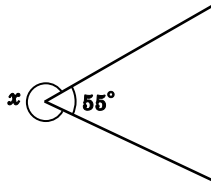
Name: \_\_\_\_\_ Class: \_\_\_\_\_ ( ) Date: \_\_\_\_\_

Find  $x$  in each of the following figures. [Nos. 1–2]

1.



2.




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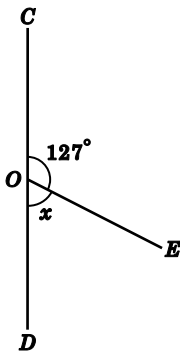
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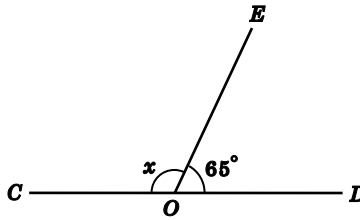
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In each of the following figures,  $COD$  is a straight line. Find  $x$ . [Nos. 3–4]

3.



4.




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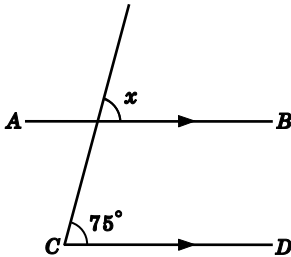
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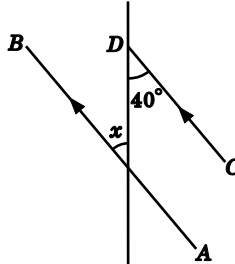
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In each of the following figures,  $AB \parallel CD$ . Find  $x$ . [Nos. 5–6]

5.



6.




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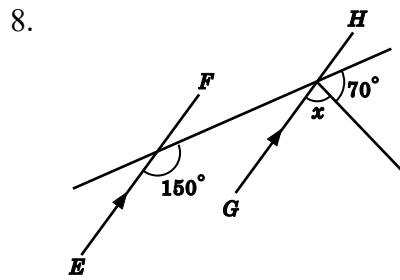
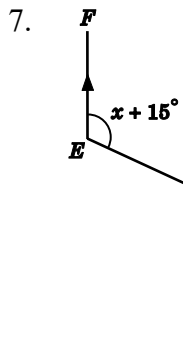


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In each of the following figures,  $EF \parallel GH$ . Find  $x$ . [Nos. 7–8]




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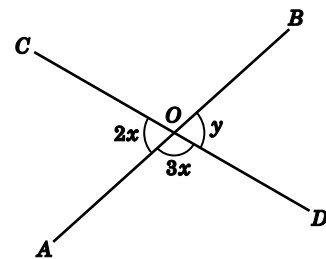
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9. \*\* In the figure,  $AOB$  and  $COD$  are straight lines.

- (a) Find  $x$  and  $y$ .
- (b) Find reflex  $\angle BOC$ .




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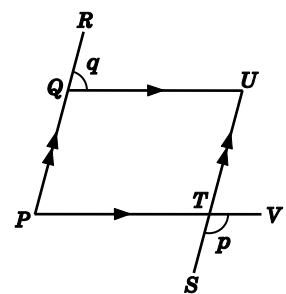
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10. \*\* In the figure,  $PR \parallel SU$  and  $QU \parallel PV$ . Is it true that  $p + q = 180^\circ$ ?

Explain your answer.




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