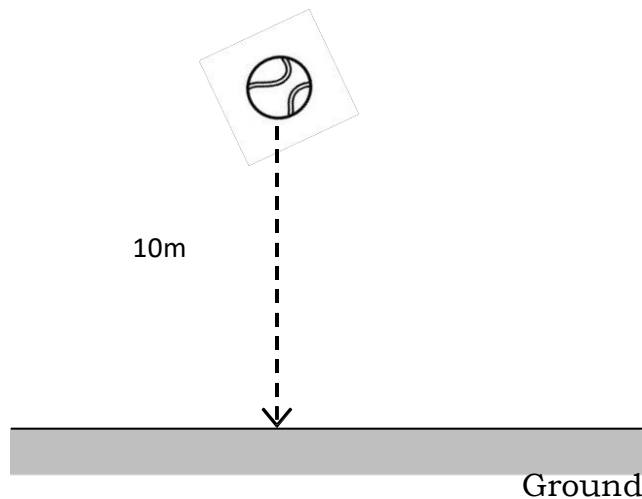


**PENANG SANGAM HIGH SCHOOL**  
**YEAR 12 MATHEMATICS**  
**WEEK 2**  
**Dates: (07/06/21) to (11/06/21)**

**Worksheet 2: Strand two: Algebra**

1. The discriminant for the expression  $y = 3x^2 + 2x - 4$  is  
A. 41  
B. 39  
C. -9  
D. 52
  
2. If the function  $h(x) = -x^3 - 3x^2 + bx + 5$  has a remainder of -2 when divided by  $x + 2$ . What is the value of b?  
A. -6  
B. -2  
C.  $\frac{3}{2}$   
D. 6
  
3. The **solution** set for  $-2x - 6 \geq 2$  is given by  
A.  $x < -4$   
B.  $x \geq -4$   
C.  $x \leq -4$   
D.  $x > -4$
  
4. Calculate the value of  $\sum_{n=9}^{11} -n^2 + 2$
  
5. Simplify  $\frac{2ce+df+cf+2de}{4e^2-f^2}$
  
6. A quadratic equation is given as  $\frac{x^2}{2} - x - 2 = 0$   
  - (i) Calculate the value of the **discriminant**.
  - (ii) Hence, state the **nature** of the roots.
  
7. Solve the equation  $3x^2 - 4x - 2 = 0$  using the quadratic formula:  
$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$
  
8. Make  $x$  the **subject** of the formula  $I = \frac{yx}{x+r}$

9. A polynomial function is given by  $f(x) = x^3 - 2x^2 - 5x + 6$   
Given that  $(x + 2)$  is one of the factors of  $f(x)$ , find the other two factors.
- 10 Find the **sum to infinity** for the sequence  $\langle 12, -3, \frac{3}{4}, \frac{-3}{16}, \dots \rangle$
- 11 The first term of an arithmetic sequence is 7 and its ninth term is -33.  
Find the common difference.
- 12 A quadratic expression is given as  $f(x) = 2x^2 - 18$ .  
Factorize  $f(x)$  completely.
- 13 Calculate the value of  $k$  given that  $x + 2$  is a factor of  
 $f(x) = x^3 + 8x^2 + 17x + k$ .
- 14 Solve:  $x^2 + 2x - 24 > 0$
- 15 A ball is dropped from a height of 10 m. With each bounce it rises to 60% of its previous height.



- Calculate the **total distance** travelled by the ball before it comes to rest.
- 16 A **geometric sequence** is given as  $\langle 1, 3, 9, 27, \dots \rangle$
- Find the common ratio.
  - Calculate the sum of the 10 terms.