

Revision Worksheet (Function and Polynomial) by Ram Hari Shrestha
SUBMIT IT BY DAY 3 OF CYCLE 8 IN THE REVISION COPY (
THIS IS WORKSHEET OF 15 MARKS)

Function

1. Define following terms:
 - a) Constant function
 - b) Identity function
 - c) Inverse function
 - d) Composite function
2. If $f = \{(3, 2), (4, 3), (5, 4)\}$ and $g = \{(2, a), (3, b), (4, c)\}$ then draw a mapping diagram to show $g \circ f$.
3. If $f(x) = 3x + 2$ and $g(x) = 2x - 1$, find $g \circ f(x)$.
4. Write the range and inverse function of the function

$$f = \left\{ \left(2, \frac{1}{2} \right), \left(3, \frac{1}{3} \right), \left(4, \frac{1}{4} \right) \right\}$$

5. Find inverse function of following functions:
 - a) $f: x \rightarrow 7x - 2$
 - b) $f = \{(x : 5x + 2) : x \in \mathbb{R}\}$
 - c) $g(x) = \frac{5x - 3}{2x + 1}$
6. Show that $g(x) = \frac{x - 2}{4}$ is the inverse of $f(x) = 4x + 2$.
7. If $h(x) = \frac{5x - 3}{2}$ then show that $h \circ h^{-1}(x)$ is an identity function
8. If $h(x) = \frac{3x - 2}{5}$ and $g(x) = x + 5$, then find x when $h \circ g(x) = 7$
9.
 - a) If $f(x) = 5x - 3$ and $f \circ g(x) = 2x + 5$, then find $g(x)$
 - b) If $f(x) = 2x - 3$ and $g \circ f(x) = 6x + 5$, then find $g(x)$
10. If functions $f(x) = \frac{x}{2 - x}$ ($2 \neq x$), $g(x) = bx - 2$ and $g \circ f(4) = -8$, find the

values of $f^{-1}(-2)$

11. Functions $f(x) = \frac{3x + 11}{x - 3}$ ($x \neq 3$) and $g(x) = \frac{x - 3}{2}$ are given. Find $f^{-1}(x)$. If $f(x) = g^{-1}(x)$, find the values of x .
12. If $g(x) = \frac{3}{3x + 1}$ and $f(x) = 5x - 4$, then find $f^{-1} \circ g^{-1}(x)$ and $f^{-1} \circ g^{-1}(-5)$.

Polynomials

1. State remainder theorem and find the remainder when $3x^3 - 5x^2 + 2x - 3$ is divided by $(x - 2)$ with the help of remainder theorem.
2. If $x^3 + ax^2 - x + 7$ leaves the remainder 4 when it is divided by $x - 3$, find the value of a .
3. State factor theorem? If $x + 1$ is a factor of $2x^3 - kx^2 - 8x + 5$, find the value of k .
4.
 - a) Show that $x - 2$ is a factor of the polynomial $x^2 - 3x + 2$
 - b) If $x - 2$ is a factor of the polynomial $x^2 - ax + 2$, find other factor.
5. If $2x + 1$ is a factor of $2x^3 + ax^2 + x + 2$, find the value of a .
6. Apply synthetic division method to find the quotient and remainder:
 - (a) $(3x^3 - 5x^2 + x - 2) \div (x + 2)$
 - (b) $(4x^3 + 2x^2 - 4x + 3) \div (2x + 3)$
7. Form a polynomial $P(x)$ whose factors are $(x + 1)$, $(x + 2)$ and $(x - 3)$.
8. Factorize the following:
 - a) $6x^3 - 13x^2 + x + 2$
 - b) $3x^3 - 13x^2 + 16$
9. Solve:
 - a) $x^3 - 4x^2 - 7x + 10 = 0$
 - b) $z^3 - 19z - 30 = 0$
10. Find the values of a and b when $2x^3 + ax^2 + bx - 2$ has a factor $(x + 2)$ and leaves a remainder 7 when divided by $2x - 3$.
11. If the polynomial $mx^3 - 8x^2 + kx + 6$ is exactly divisible by $x^2 - 2x - 3$ then find the values of k and m .