Precalculus Worksheet
Function Operation

Name Key

Given that $f(x) = 2x - 5$ and $g(x) = x^2 - 3x + 6$ find the following:

1. $(f+g)(x)$ — 1. $x^2 - x + 1$

2. $(f-g)(x)$ — 2. $-x^2 + 5x - 11$

3. $(fg)(x)$ — 3. $2x^3 - 11x^2 + 27x - 30$

4. $\left(\frac{f}{g}\right)(x)$ — 4. $\frac{2x-5}{x^2-3x+6}$

5. Find $(f+g)(2)$ — $(2)^2-(2)+1$ — 5. 3

6. Find $(f-g)(3)$ — $-(3)^2+5(3)-11$ — 6. -5

7. Find $(fg)(-2)$ — $2(-2)^3-11(-2)^2+27(-2)-30$ (-16, -44, -54, -30) — 7. -144

8. Find $\left(\frac{f}{g}\right)(6)$ — $\frac{2(6)-5}{(6)^2-3(6)+6} = \frac{7}{24}$ — 8. $2(1)^2-6(1)+7$

9. Find $(f \circ g)(1)$ — $f(g(x)) = 2(x^2-3x+6)-5 = 2x^2-6x+7$ — 9. 3 — $4(-2)^2-26(-2)+46$, $16+52+46$

10. Find $(g \circ f)(-2)$ — $g(f(x)) = (2x-5)^2-3(2x-5)+6$ — 10. 114 — $98+16=114$

$= 4x^2-20x+25-6x+15+6$

$= 4x^2-26x+46$

42

Given $f(x) = 2x^2 - 5x + 1$ and $g(x) = 2x - 3$ find the following:

1. $(f \circ g)(3)$ — $f(g(x)) = 2(2x-3)^2-5(2x-3)+1$ — $8(3)^2-34(3)+34$ — 1. 4 — $4(1)^2-10(1)-1$

$= 2[4x^2-12x+9]-10x+16$

$= 8x^2-34x+34$

2. $(g \circ f)(1)$ — $g(f(x)) = 2[2x^2-5x+1]-3$ — 2. -7

$= 4x^2-10x-1$

Given that $f(x) = x^2 + 4$ and $g(x) = 3x + 6$ find the following:

3. $(f+g)(-4)$ — $f+g = x^2+3x+10$ — 3. 14

4. $\left(\frac{f}{g}\right)(12)$ — $\frac{f}{g} = \frac{x^2+4}{3x+6}$ — $\frac{148}{42}$ $\frac{74}{21}$ — 4. $\frac{74}{21}$

5. What is the domain of $\left(\frac{f}{g}\right)(x)$ in interval notation? — Df: $(-\infty,\infty)$ Dg: $(-\infty,\infty)$ — 5. $(-\infty,-2) \cup (-2,\infty)$

6. $(f \circ g)(x)$ — $f(g(x)) = (3x+6)^2+4$ — 6. $9x^2+36x+40$

7. $(g \circ f)(x)$ — $g(f(x)) = 3(x^2+4)+6$ — 7. $3x^2+18$

Find $(f \circ g)(1)$, $(g \circ f)(3)$, $(f \circ f)(0)$.

8. $f(x) = |x+2|$ $\quad g(x) = -x^2$ — 8. 1, 8. -25, 8. 4

9. $f(x) = x$ $\quad g(x) = -3$ — 9. -3, 9. -3, 9. 0

10. $f(x) = x^2 - 1$ $\quad g(x) = \sqrt{x}$ — 10. 0, 10. $\sqrt{8} = 2\sqrt{2}$, 10. 0