Winter Break PreCalc HW solutions

DOMAIN

11. $f(x) = \sqrt{1+x}$

$1+x \geq 0$

$x \geq -1$ or $[-1, \infty)$

12. $f(x) = \frac{1}{1+x}$

$1+x \neq 0$

$x \neq -1$ or $(-\infty, -1) \cup (-1, \infty)$

13. $f(x) = \frac{1}{\sqrt{x}}$

$\sqrt{x} \neq 0$

$(\sqrt{x})^2 \neq 0^2$

$x \neq 0$ or $(-\infty, 0) \cup (0, \infty)$

14. $f(x) = \frac{1}{\sqrt{1+x}}$

$1+x > 0$

$x > -1$ or $(-1, \infty)$

15. $f(x) = \frac{1}{1+x^2}$

$1+x^2 \neq 0$

$x^2 \neq -1$

$\sqrt{x^2} \neq \sqrt{-1}$

$x = \sqrt{-1}$ ← because the solution is impossible, the DOMAIN is

$(-\infty, \infty)$

4 answers!

16. $f(x) = x^2 - 3x + 4$

$f(3) = 3^2 - 3(3) + 4$

$= 4$

$f(a) = a^2 - 3a + 4$

$f(-t) = (-t)^2 - 3(-t) + 4$

$= t + 3t + 4$

$f(x^2+1) = (x^2+1)^2 - 3(x^2+1) + 4$

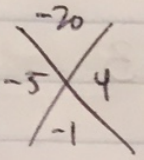
$= x^4 + 2x^2 + 1 - 3x^2 - 3 + 4$

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

FACTORING

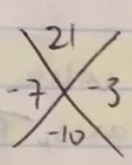
17. $x^2 - x - 20$

$(x-5)(x+4)$



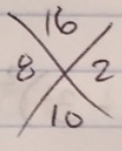
18. $x^2 - 10x + 21$

$(x-7)(x-3)$



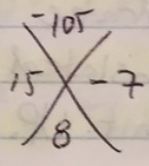
19. $x^2 + 10x + 16$

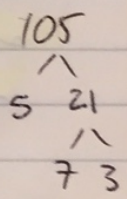
$(x+8)(x+2)$



20. $x^2 + 8x - 105$

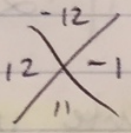
$(x+15)(x-7)$

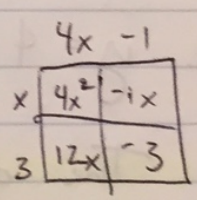




21. $4x^2 + 11x - 3$

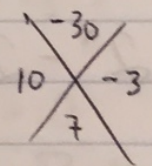
$(4x-1)(x+3)$

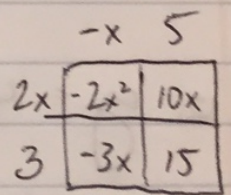




22. $-2x^2 + 7x + 15$

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





TRANSFORM PARENT FUNCTIONS

9. $y = -3|x+2| - 3$

~~An absolute value function is translated 2 units to the LEFT, flipped over~~

An absolute value function is reflected over the x-axis. The function is made THINNER, translated 2 units to the LEFT and 3 units down.

10. $y = 2(x-3)^2 + 1$

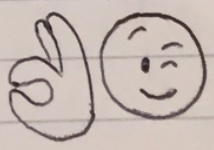
The quadratic function is made THINNER, and translated 3 units to the RIGHT and 1 unit UP.

11. $y = 4|x-1| + 2$

The absolute value function is made THINNER, and translated 1 unit to the RIGHT and 2 units UP.

12. $y = 4 \cdot 2^x - 2$

Note from Mr. Solis: We are going to see this kind of function in the next unit.



Winter Break - Algebra Review

1. $y^4(6-y)(5+y)$

$= y^4(30+6y-5y-y^2)$

$= y^4(30+y-y^2)$

$= 30y^4 + y^5 - y^6$

2. $(t-5)^2 - 2(t-3)(8t-1)$

$= t^2-10t+25 - 2(8t^2 - t - 24t + 3)$

$-25t$

$= t^2-10t+25 - 16t^2 + 50t - 6$

$= -15t^2 + 40t + 19$

3. $\frac{1}{x+5} + \frac{2}{x-3}$

$= \frac{1}{x+5}\left(\frac{x-3}{x-3}\right) + \frac{2}{x-3}\left(\frac{x+5}{x+5}\right)$

$= \frac{x-3}{(x^2-3x+5x-15)} + \frac{2x+10}{(x^2-3x+5x-15)}$

$= \frac{x-3+2x+10}{x^2+2x-15} = \frac{3x+7}{x^2+2x-15}$

4. $\dfrac{9b-6}{3b} = \dfrac{3b-2}{b}$

5. $\dfrac{x^2-1}{(x^2-9x+8)} = \dfrac{(x+1)(x-1)}{(x-8)(x-1)}$

$= \dfrac{x+1}{x-8}$

4 answers!

6. $5ab - 8abc = ab(5-8c)$

$x^2 - x - 6 = (x-3)(x+2)$

$2x^2 + 7x - 4 = (2x-1)(x+4)$

$8x^2 + 10x + 3 = (4x+3)(2x+1)$

$6 \times 4 = 24$, $6 + 4 = 10$

	4x	3
2x	$8x^2$	6x
1	4x	3