

# HW after U2 Test ANSWERS – Factoring and Functions Review (slide 1 of 3)

Solve by factoring. Show your Work! Use separate paper, if needed.  
 (Hint: Remember to ALWAYS look for a GCF first!!)

1.  $0 = y^2 - 18y + 45$   $y = 3, 15$

$0 = (y-3)(y-15)$

$0 = y-3, 0 = y-15$

3.  $c^2 + 7c = 30$   $c = -10, 3$

$c^2 + 7c - 30 = 0$

$(c+10)(c-3) = 0$

$c+10=0, c-3=0$   $x = -\frac{2}{3}, -3$

5.  $3x^2 + 11x + 6 = 0$

$\frac{9}{1} \cdot \frac{2}{3} = 6$   $3x^2 + 9x + 2x + 6 = 0$

$\frac{9}{1} + \frac{2}{3} = 11$   $3x(x+3) + 2(x+3) = 0$   
 $(3x+2)(x+3)$

7.  $2x^2 + x = 6$   $x = \frac{3}{2}, -2$

$2x^2 + x - 6 = 0$

$2x^2 + 4x - 3x - 6 = 0$

$2x(x+2) - 3(x+2) = 0$

$(2x-3)(x+2) = 0$   
 $2x-3=0, x+2=0$

2.  $a^2 + 14a + 24 = 0$   $a = -12, -2$

$(a+12)(a+2) = 0$

$a+12=0, a+2=0$

4.  $0 = 3y^2 + 24y + 45$   $y = -5, -3$

$0 = 3(y^2 + 8y + 15)$

$0 = 3(y+5)(y+3)$

~~$0 = y+5$~~ ,  $0 = y+3$

6.  $4x^2 - 11x - 3 = 0$   $x = -\frac{1}{4}, 3$

$-\frac{12}{1} \cdot \frac{1}{4} = -12$   $4x^2 - 12x + 1x - 3 = 0$

$-\frac{12}{1} + \frac{1}{4} = -11$   $4x(x-3) + 1(x-3) = 0$   
 $(4x+1)(x-3) = 0$

8.  $8x^3 + 3x = -10x^2$   $x = 0, \frac{1}{2}, \frac{3}{4}$

$8x^3 + 10x^2 + 3x = 0$

$x(8x^2 + 10x + 3) = 0$

$x(8x^2 + 6x + 4x + 3) = 0$

$x(2x(4x+3) + 1(4x+3)) = 0 \rightarrow x(2x+1)(4x+3) = 0$

$\frac{6}{6} \cdot \frac{4}{1} = 24$   
 $\frac{6}{6} + \frac{4}{1} = 10$

# HW after U2 Test ANSWERS – Factoring and Functions Review (slide 2 of 3)

Difference of Squares  
 $a^2 - b^2 = (a + b)(a - b)$

Difference of Cubes and Sum of Cubes  
 $a^3 - b^3 = (a - b)(a^2 + ab + b^2)$   
 $a^3 + b^3 = (a + b)(a^2 - ab + b^2)$

Identify the special pattern shown. Then factor completely. (Hint: Remember to ALWAYS look for a GCF first!!)

9.  $x^2 - 16 = \boxed{(x+4)(x-4)}$   
Diff. Perfect Squares

10.  $4x^2 - 16 = \boxed{4(x+2)(x-2)}$   
 GCF,  $4(x^2 - 4)$

11.  $x^3 + 27 = \boxed{(x+3)(x^2 - 3x + 9)}$   
 $a=x, b=3$   
Sum of perfect cubes

12.  $x^3 - 64 = \boxed{(x-4)(x^2 + 4x + 16)}$   
 $a=x, b=4$   
Diff. Perfect Squares

13.  $3x^3 - 24 = \boxed{3(x-2)(x^2 + 2x + 4)}$   
 GCF,  $3(x^3 - 8)$   
Diff. of Cubes  $a=x, b=2$

14.  $x^4 - 81 = \boxed{(x+3)(x-3)(x^2 + 9)}$   
Diff. of Perfect Cubes  
Diff. of Squares  $(x^2 - 9)(x^2 + 9)$

15.  $16x^2 + 9 = \boxed{\text{Prime}}$   
Sum of Squares are Prime!

16.  $8x^3 + 125 = \boxed{(2x+5)(4x^2 - 10x + 25)}$   
 $a=2x, b=5$   
Sum of Cubes  $(2x+5)((2x)^2 - 2x \cdot 5 + 5^2)$

17.  $32x^2 - 18 = \boxed{2(4x-3)(4x+3)}$   
 GCF,  $2(16x^2 - 9)$   
Diff. of Squares

18.  $16 - 2x^3 = \boxed{2(2-x)(4+2x+x^2)}$   
 GCF,  $2(8 - x^3)$   
Diff. of Cubes  $a=2, b=x$

# HW after U2 Test ANSWERS – Factoring and Functions Review (slide 3 of 3)

Simplify the following completely given  $f(x) = 2x^2 - 7x + 5$ . Show your work!

19.  $f(3) = \boxed{2}$

$$f(3) = 2(3)^2 - 7(3) + 5$$
$$2 \cdot 9 - 21 + 5 = 18 - 21 + 5$$

21.  $f(3x) = \boxed{18x^2 - 21x + 5}$

$$f(3x) = 2(3x)^2 - 7(3x) + 5$$
$$= 2(9x^2) - 21x + 5$$

23.  $f(-x) = \boxed{2x^2 + 7x + 5}$

$$f(-x) = 2(-x)^2 - 7(-x) + 5$$
$$= 2(x^2) + 7x + 5$$

20.  $f(-3) = \boxed{44}$

$$f(-3) = 2(-3)^2 - 7(-3) + 5$$
$$2(9) + 21 + 5 = 18 + 21 + 5$$

22.  $f(x+3) = \boxed{2x^2 + 5x + 2}$

$$f(x+3) = 2(x+3)^2 - 7(x+3) + 5$$
$$= 2(x+3)(x+3) - 7x - 21 + 5$$
$$2(x^2 + 6x + 9) - 7x - 16 = 2x^2 + 12x + 18 - 7x - 16$$

24.  $f(3-4x) = \boxed{32x^2 - 20x + 2}$

$$f(3-4x) = 2(3-4x)^2 - 7(3-4x) + 5$$
$$= 2(3-4x)(3-4x) - 21 + 28x + 5$$