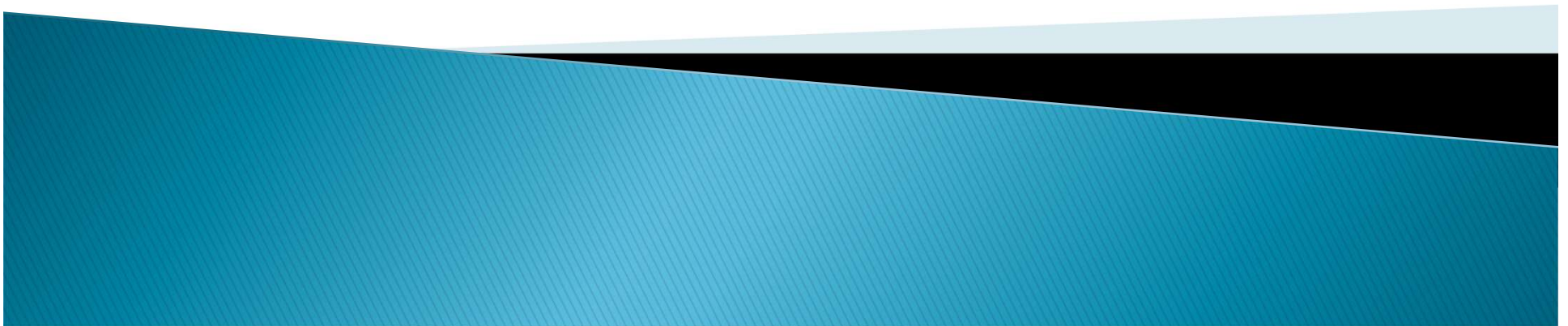


## Quiz today:

- \*Very similar to practice quiz from a few days ago
- \* No calculator, no notes
- \* 20 points



# 1.3 Online assignment #13:

$$\text{Factor: } 125x^3 + y^3 = (5x + y) \left( (5x)^2 - (5x)(y) + (y^2) \right)$$

$$a^3 = 125x^3 \rightarrow a = 5x$$

$$b^3 = y^3 \rightarrow b = y$$

$$= (5x + y) (25x^2 - 5xy + y^2)$$

$$a^3 + b^3 = (a + b)(a^2 - ab + b^2)$$

Diagram illustrating the signs in the sum of cubes formula:

- Arrows from "same sign" point to the plus signs in  $(a + b)$ .
- Arrows from "opposite sign" point to the minus sign in  $(a^2 - ab + b^2)$ .
- An arrow from "always +" points to the plus sign in  $b^2$ .

# Other types of factoring that apply to yesterday and today:

**FOIL:**

factor:  $x^2 - 12x + 27 = (x-3)(x-9)$

*Handwritten annotations:*  
- "add" above the minus sign  
- "multiply" above the equals sign  
- "F" with an arrow pointing to  $x^2$   
- "O" and "I" below the minus sign  
- "L" with an arrow pointing to the constant term 27

expand (multiply):  $(x+3)(x-7) = x^2 - 4x - 21$

*Handwritten annotations:*  
- A red bracket under  $(x+3)(x-7)$  with  $+3x$  and  $-7x$  written below it, indicating the expansion process.

**GCF:**

$$x^2 - 2xy = x(x - 2y)$$

$$5x^2y - 20xy + 15y = 5y(x^2 - 4x + 3)$$

Greatest  
Common  
Factor

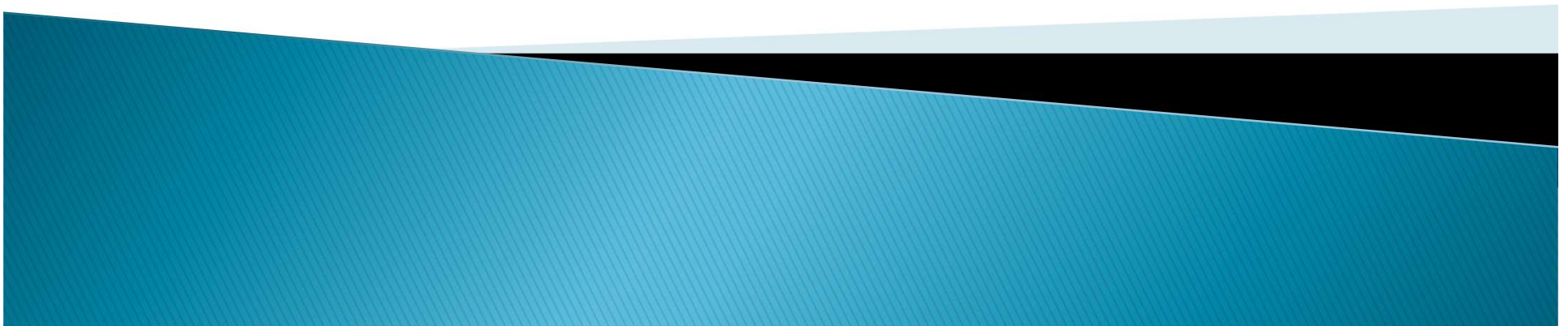
# Notes 1.4 Domain & Range

## Domain:

the set of all input values ( $x$ ) for a function

## Range:

the set of all output values ( $y$ ) for a function



## Notes 1.4 Domain

Radical expressions:

If given  $\sqrt{x} \rightarrow$  then solve  $x \geq 0$

*x cannot be negative*

Fractional expressions:

If given  $\frac{y}{x} \rightarrow$  then solve  $x \neq 0$

*denominator  $\neq 0$*

# Notes 1.4 → EXAMPLES

Write the given problem, then state the domain.

a.  $\sqrt{2x+11}$

$$2x+11 \geq 0$$

$$2x \geq -11$$

$$x \geq \frac{-11}{2}$$

b.  $\frac{3x}{x^2-5}$

$$x^2 - 5 \neq 0$$
$$\pm\sqrt{x^2} \neq \pm\sqrt{5}$$

$$x \neq \pm\sqrt{5}$$

c.  $-3x^2 + 4$

$$x = \text{all real numbers}$$

or  $x = \mathbb{R}$

or  $x \in \mathbb{R}$

↑  
element of

## Today's assignment: 1.4 #16,30, 7-14, 15-31odd

Simplify the rational expression

$$16. \frac{4(x^2 - 1)}{12(x + 2)(x - 1)} = \frac{(4)(x+1)(\cancel{x-1})}{(4)(3)(x+2)(\cancel{x-1})} = \frac{x+1}{3(x+2)}$$

$$30. \frac{x^2 - x - 6}{x^2 + 2x} \cdot \frac{x^3 + x^2}{x^2 - 2x - 3} = \frac{(x-3)(x+2)(x^2)(x+1)}{(x)(x+2)(x+1)(x-3)} = x$$



## Check evens for today:

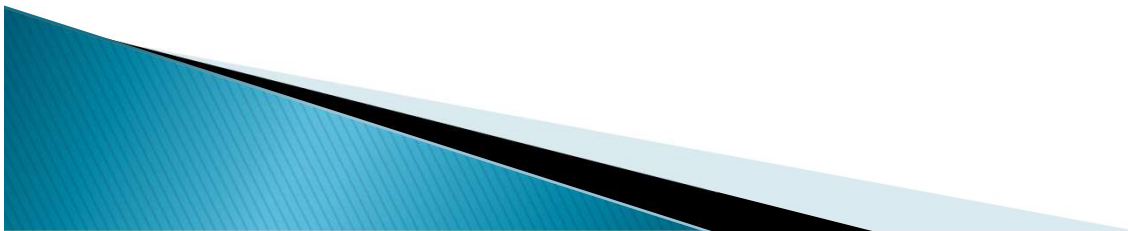
8.  $x = \text{real numbers}$

10.  $t \neq -2$

12.  $x > 1$

14.  $x \geq 0$

*( $x \neq -1$  isn't necessary since it is already excluded from  $x \geq 0$ )*



**R  
E  
M  
I  
N  
D  
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S**

- ▶ Check odd answers as you progress through the assignment.
  - ▶ If something is incorrect, try to find your error and fix it...or ask someone how they solved the problem.
  - ▶ Homework (written and online) is graded on completion and is worth 5 points per assignment.
  - ▶ Late work is not accepted unless you come in during tutorial to finish it. Two late assignments per unit allowed.
- 