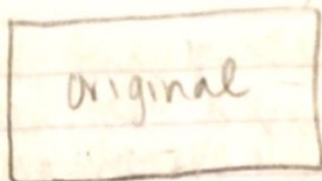
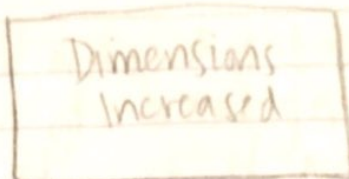


# Unit 4 Control

1.



$w+2$



$w+2$

$w+4$

$a = lw$ , so  $(w+4)(w+2) = FOIL$

$$w^2 + 2w + 4w + 8$$

$$w^2 + 6w + 8 \quad \boxed{B}$$

2. - First, look at the y-intercept + see if you can cross any out.

- Can cross off D because the y-int is 0 and not 5.

- Now, look at the "a" value in  $y = ax^2 + bx + c$

- The "a" value tells you how "fat" or "skinny" the parabola will be. Larger numbers = skinnier parabola because it grows quicker. Now, you can cross off "B" because it's wider than A + C.

- Now, remember the "smile" & "frown" rule. The "a" term of 2 is positive, so the shape of the graph will be a smile  $\cup$  - the answer is  $\boxed{A}$ .

3. Remember, a cube is any number times itself 3 times. What number multiplies by itself 3 times to get 27? 3! Now, automatically you've narrowed it down to B or D.

Next, take out exponents according to how many times they can be factored out  $a^b$  can be taken out as  $a^2$  because  $2 \cdot 3 = 6$



-  $b^5$  and  $c^2$  can't be taken out, but can be simplified to  $5/3$  and  $2/3$ , so  
 [D]  $3a^2b^{5/3}c^{2/3}$  is the correct answer.

\* They try to trick you w/ choice B!

4.  $x^2 - 81 = (x + 9)(x - 9)$

[D] - this is a difference of squares.

5.  $A = \frac{1}{2}hb$  - solve for  $h$ !

$2A = \frac{1}{\cancel{2}}hb$

$\frac{2A}{b} = \frac{hb}{b}$

[D]  $h = \frac{2A}{b}$

b. - Since there were originally 3 statues in a museum, you can cross off C, which has -3.  
 - Next, look at the question to see that  $S(n)$  refers to the number of statues in any year.  
 - You know this # needs to be 26, so you could either plug in 185 for  $S(n)$  + solve + see which equation equals 26.

[D]  $185 = 7n + 3$   
 $- 3 \quad - 3$

$\frac{182}{7} = \frac{7n}{7}$

[D]  $n = 26$



7. Since she began w/ 2 dolls it is represented by +2, so you can automatically tell the answer is  $\textcircled{C}$

8.  $(m^{\frac{3}{5}})^5 = \frac{m^{\frac{3}{5}}}{5} = \frac{1}{5m^{\frac{3}{5}}} = \frac{1}{m^3}$

$\frac{5 \cdot \textcircled{3}}{1 \cdot 5}$

9.  $a = 600$  sq. meters  
 car = 6 sq. m =  $x$   
 bus = 30 sq. m =  $y$   
 max = 60 vehicles

Step 1: create 2 formulas - one to represent area & one to represent # of vehicles

Formula to represent area =  $6x + 30y = 600$

Formula to represent # of vehicles =  $x + y = 60$

Now - use substitution ~~(or elimination)~~

$$6x + 30y = 600$$

$$x + y = 60$$

$$\begin{array}{r} -y \quad -y \\ \hline x \quad -y + 60 \end{array}$$

$$6(-y + 60) + 30y = 600$$

$$-6y + 360 + 30y = 600$$

$$24y + 360 = 600$$

$$-360 \quad -360$$

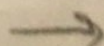

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$$24y = 240$$

$$\frac{24y}{24} = \frac{240}{24}$$

$$y = 10 \text{ (buses)}$$

- If 60 vehicles + 10 are buses, that's 50 cars.





- If each car costs \$3, then  $50 \times 3 = 150$   
 \$8 for buses  $8 \times 10 = 80$   
 $150 + 80 = \boxed{\$230 \text{ B}}$   $3x + 8y = 230!$

10.  $V = lwh$

$$2(3x-1)(x-2)$$

$$3x^2 - 6x - x + 2$$

$$2(3x^2 - 7x + 2)$$

$$\boxed{6x^2 - 14x + 4 \text{ D.}}$$

11. Make a table - the ground is 0, so when you get 0 in the table, that's the answer, t.

h	$-16t^2 - 48t + 160$	t
96	$-16(1^2) - 48(1) + 160$	1
0	$-16(2^2) - 48(2) + 160$	2

$\boxed{\text{It will take 2 seconds to hit the ground (zero feet)}}$



## Ch. 4 control Cont...

12. 1 mi in 30 min - Michelle  
3520 yards in 40 min - Zach  
1 mi = 1,760 yds

Step 1: Convert Zach's 3,520 yards into miles  
by dividing  $3520 / 1,760 = 2$  miles

- Since the question is asking in miles per hour how much faster Zach walked compared to Michelle, the next step is to convert each ratio to miles per hour from miles per minutes.

- Michelle:  $\frac{30 \text{ min}}{60 \text{ hr.}} = .5$

$\frac{1 \text{ mi}}{.5 \text{ hrs}} = \boxed{2}$

- Zach:  $\frac{40}{60} = .66$

$\frac{2 \text{ mi}}{.66 \text{ hrs.}} = \boxed{3}$

\* Since Zach walked at a rate of 3 miles per hour + Michelle 2 miles per hour, Zach walked 1 mile per hour faster than Michelle.

13. Step 1: Assign Matthew + Cooper a letter value

- Matthew = x

- Cooper = y

Step 2: Make an equation

$$5x + 2y = 52$$

$$y = 4x$$



13. cont...

Step 3: substitute!

$$5x + 2y = 52 \quad + y = 4x$$

$$5x + 2(4x) = 52$$

$$5x + 8x = 52$$

$$\frac{13x}{13} = \frac{52}{13}$$

$x = 4$  - Matthews age  
(now plug it in to get  $y$ )

$$5(4) + 2y = 52$$

$$20 + 2y = 52$$

$$\begin{array}{r} -20 \\ 20 + 2y = 52 \\ \hline \end{array}$$

$$\frac{2y}{2} = \frac{32}{2}$$

$$y = 16 \text{ - Cooper's age}$$

14.

$$p = 20$$
$$l = 2w + 1$$

$$p = 2l + 2w$$

$$20 = 2(2w + 1) + 2w$$

$$20 = 4w + 2 + 2w$$

$$20 = 6w + 2$$

$$\begin{array}{r} -2 \\ 20 = 6w + 2 \\ \hline \end{array}$$

$$\frac{18}{6} = \frac{6w}{6} \quad w = 3$$

$$20 = 2l + 2(3)$$

$$20 = 2l + 6$$

$$\begin{array}{r} -6 \\ 20 = 2l + 6 \\ \hline \end{array}$$

$$\frac{14}{2} = \frac{2l}{2}$$

$$l = 7 \text{ cm}$$



$$15. \quad x + (x+1) + (x+2)$$

$$x(x+2) = 21 + 9(x+1)$$

$$x^2 + 2x = 21 + 9x + 9$$

$$x^2 + 2x = 30 + 9x$$

$$\begin{array}{r} -9x \qquad -9x \\ \hline \end{array}$$

$$x^2 - 7x = 30$$

$$\begin{array}{r} -30 \quad -30 \\ \hline \end{array}$$

$$x^2 - 7x - 30 = 0$$

$$(x-10)(x+3)$$

$$x-10=0$$

$$x+3=0$$

$$+10 \quad +10$$

$$\begin{array}{r} -3 \quad -3 \\ \hline \end{array}$$

$$\therefore x = 10 \text{ positive} \quad x = -3 \text{ X negative}$$

16. It is not accurate because the measurements of the dimension of the tabletop are only as precise as the nearest tenth of a foot. Precision can be increased through calculations.

$$x^2 - 4x - 12$$

$$17. \quad A = \frac{1}{2}bh$$

$$\left(\frac{1}{2}\right)(x-6)(2x+4) \text{ (First FOIL)}$$

ignore until end!

$$2x^2 + 4x - 12x - 24$$

$$\begin{array}{r} -8x \\ \hline \end{array}$$

\* Now divide everything by 2!

$$\boxed{x^2 - 4x - 12}$$