Ma 9 – Flashback (week 27)

1. Determine the linear equation (rule) that models the following pattern: 10, 7, 4, ...

x	y
1	10
2	7
3	4

(−3, −3) → $-3x + 13 = y$

$-3(1) + \square = 10$

2. A population of bacteria doubles every hour. If there are 12 bacteria at the start of the hour, how many bacteria are there after 3 hours? 20 hours? 2 days?

after so many hours

x	y
0	12
1	24
2	48
3	96
4	192

not linear because going up by different amts

x	y
0	12
1	$12 \cdot 2$
2	$12 \cdot 2 \cdot 2$
3	$12 \cdot 2 \cdot 2 \cdot 2$
4	$12 \cdot 2 \cdot 2 \cdot 2 \cdot 2$

rule: $12 \cdot 2^x$

∴ after 20 hours: $12 \cdot 2^{20}$ (huge #!)

after 2 days (48 hours!) $= 12 \cdot 2^{48}$ (really huge!)

3. Jane wants to host a party at the community hall. The hall charges a flat fee of $150 plus an additional fee of $5 per person.

   a) create a table of values to show the costs for the first 10 people.

   b) What equation could model this situation?

   c) how much would it cost if 40 people came to the party?

x	y
1	155
2	160
3	165
4	170
5	175
6	180
7	185
8	190
9	195
10	200

(+5, +5) → $5x + 150 = y$

∴ 40 people:

$5(40) + 150 = y$

$200 + 150 = y$

$\$350 = y$

4. Simplify: $\frac{(3^3-5)\cdot 3\div(-11)+4}{4^2-(3^2\cdot 6)^0}$ →

$$\frac{(27-5)\cdot 3\div(-11)+4}{4^2-(9\cdot 6)^0}$$

$$\frac{(22\cdot 3)\div(-11)+4}{4^2-(15)^0}$$

$$\frac{66\div(-11)+4}{16-1}$$

$$\frac{-6+4}{15} \rightarrow \frac{-2}{15}$$

B
E
DM
AS

5. Determine the quotient: $\frac{12x^2-8xy}{4x}$ → $\frac{12x^2}{4x} - \frac{8xy}{4x}$ → $3x - 2y$

dividing
distributive

division law

6. Draw algebra tile model for the opposite of $-3x^2 + 2x - 1$

flip

7. Solve and verify: $12x - 0.7 = 5x + 3.2$

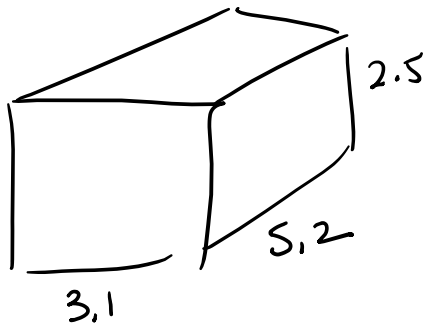
$$12x - 0.7 = 5x + 3.2 \quad (\times 10)$$
$$120x - 7 = 50x + 32$$
$$-50x \quad -50x$$
$$70x - 7 = 32$$
$$+7 \quad +7$$
$$\frac{70x}{70} = \frac{39}{70}$$
$$x = \frac{39}{70}$$

B
F - must buy 10 to remove dec.
S
D

8. Mandy wants to wallpaper all four walls in her room. The dimensions of the floor are 5.2 m by 3.1 m. The walls are 2.5 m high. There is one window that is 1.5 m by 1.5 m. The closet and bedroom doors are both are 2.2 m by 0.75 m.

   a) What is the total surface area that will be covered with wallpaper?

   b) If one roll of wall paper covers 5.2 m^2, how many roles should she purchase?



* only 4 walls wallpapered (ignore floor & ceiling)
* walls are rectangles
* don't wallpaper over doors or window (so minus these)

Area of walls

$2(3.1 \cdot 2.5) + 2(5.2 \cdot 2.5)$

$15.5 + 26$

$41.5\ m^2$

Doors & Window

$2(2.2 \cdot 0.75) + (1.5)(1.5)$

$3.3 + 2.25$

$5.55\ m^2$

$\therefore$ total SA $= 41.5 - 5.55$

$= 35.95\ m^2$

So if 1 roll $= 5.2\ m^2$

then $? = 35.95\ m^2$

$\frac{1}{x} = \frac{5.2}{35.95}$

flip

$\frac{x}{1} = \frac{35.95}{5.2}$

$x \doteq 6.91$ rolls

$\therefore$ purchase 7 rolls!

9. Simplify: $\frac{(2x^3 \cdot x^5)^2}{(x^6)^4}$

Power mult. exp.

$\frac{(2^2 x^6 x^{10})}{x^{24}}$ → mult law $\frac{4x^{16}}{x^{24}}$ → Division law $4x^{-8}$

or

$\frac{4}{x^8}$