

Exit Ticket:

Rewrite and keep as exponential number with base 2. Simplify. Given $x = (2^3)$

$4 = (2^2)$ · Rewrite 4
· Sub 4's value in

$$\sqrt[5]{2^{35}} \times 4^{-\frac{1}{2}} - x^2$$

$$\sqrt[5]{2^{35}} \times 4^{-\frac{1}{2}} - (2^3)^2$$

$$\sqrt[5]{2^{35}} \times (2^2)^{-\frac{1}{2}} - (2^3)^2$$

law 5 law 5

$$2^{\frac{35}{5}} \times 2^{-1} - 2^6$$

- Simplify
- ① B
 - ② E / Rad
 - ③ { m.
 - ④ { 4 S.
- solve eq.

$$2^7 \times 2^{-1} - 2^6$$

law 3

$$r \cdot a^n + s \cdot a^n = (r+s) a^n$$

$$x^6 - x^6 = 0$$

$$\cancel{1 \cdot 2^6} - \cancel{1 \cdot 2^6} =$$

$$(1 - 1) \cdot 2^6$$

$$0 \cdot 2^6$$

} optional

0

Lesson 4: $+ - \times \div$ Operations on Polynomials March 28th
 and Factoring Polynomials 2024

ex.

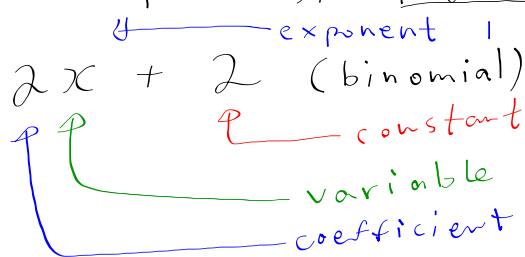
$$(2x + 2)x^2$$

Definition: a polynomial is an algebraic expression w constants and variables.

expression :

$$2 + 2$$

· expression
 · more precisely, a polynomial



$$2x^3 \quad (\text{monomial})$$

$$2x^2 + x + 3 \quad (\text{trinomial})$$

$$4x^2 + x(x - 2) - 1 \quad (\text{trinomial})$$

Multiplying Monomials

Recall brackets:

ex 1. ex 2

: minus
: subtract

different

$$3m^3n^2 - 4m^3n^2$$

$$-1 \cdot m^3n^2$$

$$-m^3n^2$$

negative)

$$3m^3n^2(-4m^2n^2)$$

$$3 \times -4 \cdot m^{3+2} \cdot n^{2+2}$$

$$-12m^5n^4$$

law 3

You do:

i. $7a^2b^1 \cdot \frac{4}{3}b^2c^3$

$$= \frac{-4}{3}a^2b^3c^3$$

ii. $\frac{2}{3}a^2b^4 \cdot \frac{3}{2}b^{-2}c^4$

$$a^2b^2c^4$$

iii. $-x^4y^2z^3(-3x^4y^2z^3)$

$$= 3x^8y^2z^6$$

$$a^n \times a^m = a^{n+m}$$

$$ra^n \times sa^m = (r \times s)a^{n+m}$$

$$ra^nb^x \times sa^mb^y = (r \times s)a^{n+m}b^{x+y}$$

You do:

all of pg 21

↳ do until

12:40

Dividing Monomials

Simplify:

ex.

$$\frac{6x^3y^2z}{3x^2y^1z}$$

law 4

$$2x^{3-2} \cdot y^{2-1}$$

$$2x \cdot y$$

law 4

$$\frac{a^m}{a^n} = a^{m-n}$$

ex.

$$-1a^2b \div \frac{4b^2c^3}{3}$$

keep change flip

$$-1 \cdot a^2b \div \frac{4}{3} b^2c^3$$

coefficient

$$\frac{-1a^2b^1}{\frac{4}{3}b^2c^3}$$

$$-1 \div \frac{4}{3} \quad \boxed{\frac{a}{b}}$$

$$\frac{-1}{1} \times \frac{3}{4} \quad \boxed{\frac{a^c}{b}}$$

$$\frac{-3}{4}$$

$$\frac{-3}{4} \frac{a^2b^{1-2}}{c^3}$$

law 6

$$\frac{a^{-n}}{1} = \frac{1}{a^n}$$

$$\frac{-3}{4} \frac{a^2b^{-1}}{c^3}$$

$$\frac{-3a^2}{4b^1c^3}$$

You do: Simplify

i. $\frac{-4mn^4}{-3m^5n^2} = \frac{4n^2}{3m^4}$

ii. $-m^2n(-2m^2n) = 2m^4n^2$

iii. $-m^2n - 2m^2n = -3m^2n$

$$\frac{-3a^2}{4bc^3} = -\frac{3}{4} \frac{a^2}{b \cdot c^3}$$

iv. $4x^2 \div \frac{-x^2y}{2} = \frac{-8}{y}$

v. $4x^2 - x^2 = 3x^2$

vi. $5a^3b^2 - 3a^3b^2c - 10ab^2c + 2a^3b^2c$
 $= 5a^3b^2 - a^3b^2c - 10ab^2c$

AND finish pg 21 5 min

$$\frac{4x^2}{-\frac{1}{2}x^2y}$$

$$\frac{-8}{y}$$

$$\frac{4x^2 - 2}{1} = -8$$

Dividing a Polynomial by a Monomial

Recall brackets

ex. 1

$$(3x^3 - 9x^2 + 6x) \div 3x$$

$$\frac{3x^3 - 9x^2 + 6x}{3x}$$

$$\frac{3x^3}{3x} - \frac{9x^2}{3x} + \frac{6x}{3x}$$

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

ex. 2

$$3x^3 - 9x^2 + 6x \div 3x$$

$$3x^3 - 9x^2 + \frac{6x}{3x}$$

$$3x^3 - 9x^2 + 2$$

must divide each term individually

ex.

$$(3x^2y^2 - 4xy) \div -xy$$

$$\frac{3x^2y^2 - 4xy}{-xy}$$

$$\frac{3x^2y^2}{-xy} - \frac{4xy}{-xy}$$

$$-3xy + 4$$

\times	\div	adjacent sign
+	+	+
-	-	+
-	+	-

You do:

i. $(10x^7 - 5x^5 - 25x^3) \div 5x^2 = 2x^5 - x^3 - 5x$

ii. $(80x^3y^3 - 40x^7y^4) \div -10xy^2 = -8x^2y + 4x^6y^2$

iii. $6a^2 - 9a^3b^4 - 15a^2b^4 \div -3b^4$

$$6a^2 - 9a^3b^4 - \frac{15a^2b^4}{-3b^4}$$

$$6a^2 - 9a^3b^4 + 5a^2$$

$$11a^2 - 9a^3b^4$$

5 min

Subtracting Polynomials

ex. Simplify

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

$$\cancel{x^3} - \underline{2x} + \underline{3} - \cancel{x^3} - 3x^2 + \underline{1x} - \underline{3}$$

$$-3x^2 - x$$

drop
brackets
after
distributing
the (-)
sign.

You do: Simplify

$$-x^2 + 4x - (-x^2 - 5x + 3)$$

$$\cancel{-x^2} + \underline{4x} + \cancel{x^2} + \underline{5x} - 3$$

$$9x - 3$$

Multiplying a Polynomial by a Monomial

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

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

~~Nov: $-2x^2 \cdot 6x$
 $-12x^3$~~

- just do x twice
- use law of sign to know if it's (+) or (-)

$$r a^n \times s a^m = (r \times s) a^{n+m}$$

ex. $-7x(-4x^2 + 2) + 3x^2(x - x^2)$

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

$$-3x^4 + 7x^3 - 2x$$

You do: Evaluate

i. $3x^2(x-2) - x^2(2x^2 - 3x + 1)$
 $= -2x^4 + 6x^3 - 7x^2$

AND
handout pg 15
just #1.9 - 1.10

ii. $y(3x + y) - x(4y - 3)$
 $= y^2 - xy + 3x$

iii. $xy(x^2 - y^2) - (2x^2 - 3x + 1) + y(2x^3 - 3xy^2 - 2)$
 $= 3x^3y - 4xy^3 - 2x^2 + 3x - 2y - 1$

- (Decomposing) (GST) (start with an hour left)
- Factoring a Polynomial by factoring out a Greatest Common Factor (GCF)

ex. Factor

→ $10x + 16$

$$\frac{10x}{2} + \frac{16}{2}$$

→ $2x(5x + 8)$

Check:
evaluate:
 $2(5x + 8)$
 $10x + 16$

Not $5x + 8$

step i. Identify the GCF (by listing all the factors of each term)

10	16
1 x 10	1 16
2 x 5	2 8
3 x 3.3	4 4

GCF: 2

step ii. Write GCF in front of empty brackets
 $2(\quad)$

step iii. Divide each term by GCF and put answer in brackets
Rewriting exp. as x of factor

ex. Factor

$$\frac{12y}{6} - \frac{18}{6}$$

$$6(2y - 3)$$

check
evaluate

$$6(2y - 3)$$

$$12y - 18$$

12

1	12
2	6
3	4

18

1	18
2	9
3	6
4	4.5

gcf : 6

e.x. Factor

$$\frac{6x^3}{3x} - \frac{9x^2}{3x} + \frac{3x}{3x}$$

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

check

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

$$6x^3 - 9x^2 + 3x$$

$$3x \times 1$$

$$= 3x$$

nota bene:

include common variables in GCF.
use the lowest exponent.

$$\text{GCF} : 3x$$

$$3$$

$$1 \text{ } \textcircled{3}$$

You do: Factor:

$$\text{i. } 2x^7 + 4x^4 - 6x^2y \\ = 2x^2(x^5 + 2x^2 - 3y)$$

$$\text{ii. } x^3 - 2x^2 - x \\ = x(x^2 - 2x - 1)$$

$$\text{iii. } 8x^6 + 4x^5 - 6x^3 \\ = 2x^3(4x^3 + 2x^2 - 3)$$

$$\text{iv. } 3x^2y^3 - 9x^2y^4 + 12xy^3 \\ = 3xy^3(x - 3xy + 4)$$

Bonus:

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

You do:

AND: # 1, 2, 3 pg 28

HWK:

- handouts
- last handout not # 31-40, #46-48