

SEMESTER 2 REVIEW

2 terms

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

$$4x^2 - 49 = (2x+7)(2x-7)$$

$$x^2 + 25 = \text{not factorable}$$

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

square - multiply - square

$$x^3 + 8 = (x+2)(x^2 - 2x + 4)$$

3 terms

UnFOIL

$$x^2 - 6x - 16$$

$$(x+2)(x-8)$$

4 terms

Grouping

$$(x^3 - 6x^2) + (4x - 24)$$

$$1) x^2(x-6) + 4(x-6)$$

$$2) (x-6)(x^2+4)$$

$$\frac{x^3 - 4x^2 + 7}{x - 2}$$

$$x - 2$$

$$\begin{array}{r} 2 \big) 1 \quad -4 \quad 0 \quad 7 \\ + 0 \quad 2 \quad -4 \quad -8 \\ \hline 1 \quad -2 \quad -4 \quad -1 \end{array}$$

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

Rules of Exponents

$$x^m \cdot x^n = x^{m+n}$$

$$x^3 \cdot x^5 = x^8$$

$$6^5 \cdot 6^{-2} = 6^3 = 216$$

$$(x^m)^n = x^{m \cdot n}$$

$$(x^3)^7 = x^{21}$$

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

$$\frac{x^5}{x^2} = x^3 \left\{ \frac{x^4}{x^1} = \frac{1}{x^3} \right.$$

$$x^{-m} = \frac{1}{x^m}$$

$$x^0 = 1$$

$$x^{2/3} = \sqrt[3]{x^2}$$

~~$$\frac{x^{-2}}{x^{3+2}} = \frac{1}{x^5}$$~~

$$\frac{(a^6 b^{-2})^3 (a^{-3} b^5)^{-2}}{a^{17} b^{-5}}$$

$$= \frac{(a^{18} b^{-6})(a^6 b^{-10})}{a^{17} b^{-5}}$$

$$= \frac{a^{24-17} b^{-16}}{a^{17} b^{-5+16}} = \left(\frac{a^7}{b^{11}} \right)$$

$$7^{-5} \cdot 7^2 = 7^{-3} = \frac{1}{7^3} = \frac{1}{343}$$

$$81^{3/2} = \sqrt{81^3} = 9^3 = 729$$

$$\sqrt[4]{a^7 b^{20}} \cdot \sqrt[4]{a^6 b^{18}}$$

$$= \sqrt[4]{a^{13} b^{38}}$$

$$a^3 | b^9 | \sqrt[4]{a^1 b^2}$$

abs value if even-even-odd
 index power power
 inside outside

Like 18
Solve.

$$\sqrt{x+4} - \sqrt{x-4} = 2$$

$$(\sqrt{x+4})^2 = (2 + \sqrt{x-4})^2$$

$$x+4 = (2 + \sqrt{x-4})(2 + \sqrt{x-4})$$

$$x+4 = \cancel{x} + 2\sqrt{x-4} + 2\sqrt{x-4} + \cancel{x-4}$$

$$\cancel{-x} + 4 = 4\sqrt{x-4} + \cancel{-x}$$

$$\frac{4}{4} = \frac{4\sqrt{x-4}}{4}$$

$$(1)^2 = (\sqrt{x-4})^2$$

$$1 = x-4$$

$$\boxed{5 = x}$$

1) Isolate root
2) Square both sides
Repeat!

← FOIL!

← clean up.

Check!

$$\begin{aligned} \sqrt{9} - \sqrt{1} &= 2 \\ 3 - 1 &= 2 \\ 2 &= 2 \checkmark \end{aligned}$$

19 $f(x) = \frac{3x+4}{x-2}$ $g(x) = x^2 - 1$

same $(f \circ g)(-2)$ $f[g(-2)]$ $g(-2) = (-2)^2 - 1 = 3$ $f(3) = \frac{3(3)+4}{3-2} = \frac{13}{1} = 13$

$(f \circ g)(x) = \frac{3(x^2-1) + 4}{(x^2-1) - 2} = \frac{3x^2 - 3 + 4}{x^2 - 1 - 2} = \frac{3x^2 + 1}{x^2 - 3}$

Find $f^{-1}(x)$. Inverse

~~$f(x) = 3x + 8$~~
 $x = 3y + 8$

$\frac{x-8}{3} = \frac{3y}{3}$
 $\frac{x-8}{3} = y = f^{-1}$

- 1) Switch x & y
- 2) Solve for y.

