Homework Review - 11.2

(39) $3\sqrt{7} + 5\sqrt{14} + 2\sqrt{28}$

$3\sqrt{7} + 5\sqrt{7 \cdot 2} + 2\sqrt{7 \cdot 4}$

$3\sqrt{7} + 5\sqrt{7}\sqrt{2} + 2\sqrt{7} \cdot \sqrt{4}$

$(3 + 5\sqrt{2} + 2\sqrt{4})\sqrt{7}$

$(3 + 5\sqrt{2} + 2 \cdot 2)\sqrt{7}$

$(3 + 5\sqrt{2} + 4)\sqrt{7}$

$(7 + 5\sqrt{2})\sqrt{7}$

(15) $2\sqrt{a^4b^5}$

$2\sqrt{a^2 \cdot a^2}\sqrt{b^2 \cdot b^2 \cdot b}$

$2a^2b^2\sqrt{b}$

(29) $\sqrt{\frac{4}{52}}$

$\frac{\sqrt{4}}{\sqrt{52}} = \frac{2}{\sqrt{26 \cdot 2}} = \frac{2}{\sqrt{13 \cdot 2 \cdot 2}} =$

$\frac{\cancel{2}}{\cancel{2}\sqrt{13}} = \frac{1}{\sqrt{13}} \cdot \frac{\sqrt{13}}{\sqrt{13}} = \frac{\sqrt{13}}{13}$

(67) $225 savings

2 years

r = annual int.

V_0 = initial inv.

V_2 = after 2 years

$$r = \sqrt{\frac{V_2}{V_0}} - 1$$

$270 after 2 years

$$r = \sqrt{\frac{270}{225}} - 1$$

$r = 9.5\%$

Exponents and exponent properties

a^4

Exponents are a superscripted number

$a \cdot a \cdot a \cdot a$

$a^3 = a \cdot a \cdot a$

They show repeated multiplications of the same number

$\left(1 - \frac{4}{n}\right)^3 = \left(1 - \frac{4}{n}\right)\left(1 - \frac{4}{n}\right)\left(1 - \frac{4}{n}\right)$

Product of Powers Property:

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

What is it?

$a^4 \cdot a^5$

$(a \cdot a \cdot a \cdot a) \cdot (a \cdot a \cdot a \cdot a \cdot a)$

a^9

Why does it work?

How is it used?

$x^2 \cdot x^3 = x^5$

$(1-n)^3 (1-n)^3 = (1-n)^6$

$x^4 y^3 \neq (xy)^7$

HAVE TO BE THE SAME!

Power of a Power Property:

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

What is it?

Why is it true?

$(a^2)^3$

$(a \cdot a)^3$

$(a \cdot a)(a \cdot a)(a \cdot a)$

a^6

How is it used?

$(x^6)^3 = x^{18}$

$(x^2 y^4)^2 = x^4 y^8$

$(x^2 - y^3)^4 \neq x^8 - y^{12}$

↑ you can only work with 1 term at a time...

Power of a Product Property:

$$(ab)^m = a^m b^m$$

What is it?

Why does it work?

$(ab)^3$

$ab \cdot ab \cdot ab$

$a \cdot a \cdot a \cdot b \cdot b \cdot b$

$a^3 b^3$

How is it used?

$$(x^3 y^2)^4 = (x^3)^4 (y^2)^4$$
$$= x^{12} y^8$$

Quotient of Powers Property:

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

What is it?

How is it used?

$$\frac{a^9}{a^2} = a^7$$

$$\frac{(ax)^4}{ax} = (ax)^3$$

$$\frac{(ax)^4}{(bx)^2} \neq \frac{(ax)^2}{b}$$

$$\frac{a \cdot a \cdot a \cdot a \cdot x \cdot x \cdot x \cdot x}{b \cdot b \cdot x \cdot x} = \frac{a^4x^4}{b^2x^2} = \frac{a^4x^2}{b^2}$$

Power of a Quotient Property:

$$\left(\frac{a}{b}\right)^m = \frac{a^m}{b^m}$$

What is it?

Why is it true?

$\left(\frac{x}{y}\right)^3$

$\left(\frac{x}{y}\right)\cdot\left(\frac{x}{y}\right)\cdot\left(\frac{x}{y}\right)$

$\frac{x^3}{y^3}$

How is it used?

$\left(\frac{3x^2}{y}\right)^3 = \frac{(3x^2)^3}{y^3}$

$= \frac{3^3(x^2)^3}{y^3}$

$= \frac{27x^6}{y^3}$

13. $x^5 \cdot x^2$

x^7

14. $y^3 \cdot y \cdot y^4$

$y^4 \cdot y^4 = y^8$

17. $(b^7)^2$

b^{14}

18. $[(b+1)^2]^3$

$(b+1)^6$

23. $(3m^7)^4 \cdot m^3$

$(3)^4(m^7)^4 \cdot m^3$

$81m^{28} \cdot m^3$

$81m^{31}$

24. $4p^2 \cdot (3p^5)^2$

$4p^2 \cdot (3)^2(p^5)^2$

$4p^2 \cdot 9 \cdot p^{10}$

$4 \cdot 9 \cdot p^2 \cdot p^{10}$

$36p^{12}$

10. $\frac{1}{y^9} \cdot y^{15}$

y^6

11. $z^{16} \cdot \frac{1}{z^7}$

z^9

12. $\left(\frac{a}{b}\right)^8$

$\frac{a^8}{b^8}$

13. $\left(-\frac{6}{z}\right)^3$

$\frac{-6^3}{z^3}$

14. $\left(\frac{a^3}{2b^5}\right)^4$

$\frac{a^{12}}{16b^{20}}$

15. $\left(\frac{3x^4}{y^6}\right)^5$

$\frac{243x^{20}}{y^{30}}$

16. $\left(\frac{m^4}{5n^9}\right)^3$

$\frac{m^{12}}{125n^{27}}$

17. $\left(\frac{3x^7}{2y^{12}}\right)^4$

$\frac{81x^{28}}{16y^{48}}$

18. $\left(\frac{2m^5}{3n^9}\right)^5$

$\frac{32m^{25}}{243n^{45}}$

Homework:

p. 492, 3-48 (every 3rd)

p. 498, 3-45 (every 3rd)