

12.6 CHECK EVENS FROM YESTERDAY

12. $99 + 70\sqrt{2}$

18. 56

28. $16A^4 + 32A^3B^2 + 24A^2B^4 + 8AB^6 + B^8$

Binomial coefficient: for $(a + b)^n$

overall exponent →
(given)

$$\binom{n}{r} = \frac{n!}{r!(n-r)!}$$

Exponent for “b” →
when expanding
each term

Exponent
for “b”

Exponent
for “a”

when expanding

Reminder: 12.6 Notes

LOOK FOR PATTERNS!

Overall exponent = 2 → there are 3 terms

$$(x + y)^2 = x^2 + 2xy + y^2$$
$$= x^2 y^0 + 2x^1 y^1 + x^0 y^2$$

1st term 2nd term 3rd term

term term term

$\binom{n}{r}$ = binomial coefficient
 $r = \text{term \#} - 1$

29-42 ■ Terms of a Binomial Expansion Find the indicated terms in the expansion of the given binomial.

29.

The first three terms in the expansion of $(x + 2y)^{20}$

33.

The middle term in the expansion of $(x^2 + 1)^{18}$

$$\binom{20}{0} (x)^{20} (2y)^0 + \binom{20}{1} (x)^{19} (2y)^1 + \binom{20}{2} (x)^{18} (2y)^2$$

$$= 1 \cdot x^{20} \cdot 1 + 20 \cdot x^{19} \cdot 2y + 190 \cdot x^{18} \cdot 4y^2$$

$$= x^{20} + 40x^{19}y + 760x^{18}y^2$$

Solve by hand or with calculator

Be sure to show work for each individual term!

From 12.6 part 1

29-42 ■ Terms of a Binomial Expansion Find the indicated terms in the expansion of the given binomial.

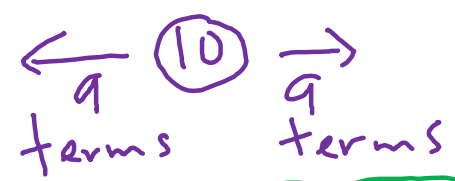
29. The first three terms in the expansion of $(x + 2y)^{20}$

33. The middle term in the expansion of $(x^2 + 1)^{18=n}$

$$\binom{18}{9} (x^2)^9 (1)^9 = 48,620 x^{18}$$

Handwritten notes: Blue arrows point from 18 to 8 and 9. Red arrows point from 18 to 8 and 9. A red 'n' is written above the 18. A red 'r' is written above the 9. The result 48,620 x^{18} is boxed.

19 terms
10th term in middle



$$r = \text{term \#} - 1$$

$$r = 10 - 1$$

$$r = 9$$

Be sure to show work when finding individual terms!

REMINDER: dividing like bases

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

keep like base, subtract exponents

$$\frac{x^{\frac{1}{2}}}{x^4} = x^{\frac{1}{2}-4} = x^{\frac{1}{2}-\frac{8}{2}} = x^{-\frac{7}{2}}$$

subtract exponents using
a common denominator

CHECK ANSWERS 12.6

#13-16, 25,26, 30-40even

(all answers included below)

Use Pascal's Triangle and Binomial Theorem as instructed in the book.

$$-4060A^3B^{27} \quad -25x^{47} \quad 3520\sqrt{2}y^3$$

$$4845a^{16}b^{16} \quad x^{15} + 30x^{\frac{29}{2}} + 435x^{14} + 4060x^{\frac{27}{2}}$$

$$1 + 3x^3 + 3x^6 + x^9 \quad x^{40} + 40x^{38} + 780x^{36}$$

$$1 - 5x + 10x^2 - 10x^3 + 5x^4 - x^5$$

$$x^4 + 8x^3y + 24x^2y^2 + 32xy^3 + 16y^4$$

$$8x^3 - 36x^2y + 54xy^2 - 27y^3$$

$$32 + 40x + 20x^2 + 5x^3 + \frac{5}{8}x^4 + \frac{1}{32}x^5$$

$$\frac{1}{x^5} - \frac{5}{x^{7/2}} + \frac{10}{x^2} - \frac{10}{x^{1/2}} + 5x - x^{5/2}$$