



DAILY QUIZ #10

Name _____

Calculators are allowed! You have **15 minutes** to complete this quiz.

1. (6pts) Determine the following for the binomial expansion of:

$$\left(x^2 - \frac{2}{x^6}\right)^{16}$$



- a. The middle term.

$$\left(x^2\right)^8 \left(-\frac{2}{x^6}\right)^8 = \left(x^{16}\right) \left(-\frac{2^8}{x^{48}}\right) = -\frac{256x^{16}}{x^{48}} = -\frac{256}{x^{32}}$$

$$\frac{16!}{(16-8)! 8!} = \frac{16!}{8! 8!} = \frac{16 \cdot 15 \cdot 14 \cdot 13 \cdot 12 \cdot 11 \cdot 10 \cdot 9 \cdot 8!}{8! 8 \cdot 7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2} = 12870 \cdot 256$$

+ 2

$$3294720x^{-32}$$

or

$$\frac{3294720}{x^{32}}$$

- b. The coefficient of the 9
- th
- term.

$$0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10$$

$$\binom{16}{8} \left(x^2\right)^8 \left(-\frac{2}{x^6}\right)^8$$

Same thing
good!

$$3294720$$

+ 2

$$x^{16} \left(\frac{256}{x^{48}}\right) = \frac{256x^{16}}{x^{48}}$$

$$\frac{256}{x^{32}}$$

$$\frac{16!}{8! 8!} = \frac{16 \cdot 15 \cdot 14 \cdot 13 \cdot 12 \cdot 11 \cdot 10 \cdot 9 \cdot 8!}{8! 8 \cdot 7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2}$$

- c. The term with no
- x
- .

16

$$\left(x^2\right)^{12} \left(-\frac{2}{x^6}\right)^4$$

$$\left(x^{24}\right) \left(-\frac{2^4}{x^{24}}\right) = -2^4 = 16$$

$$\frac{16!}{16-4! 4!} = \frac{16!}{12! 4!} = \frac{16 \cdot 15 \cdot 14 \cdot 13 \cdot 12!}{12! 4 \cdot 3 \cdot 2} = 1820$$

$$1820 \cdot 16 =$$

$$29120$$