
Example: Laurie makes \$45,891 per year.

Problem: How much is taken off in federal tax?

Solution:

Step 1: Calculate 15% of \$38,832 (15% = .15)
 $\$38,832 \times .15 = \$5,824.80$

Step 2: $\$45,891 - \$38,832 = \$7,059$

Step 3: Calculate 22% of \$7,059 (22% = .22)
 $\$7,059 \times .22 = \$1,552.98$

Step 4: Add together: $\$5,824.80 + 1,552.98 = \$7,377.78$

Laurie has \$7,377.78 taken off in federal taxes per year.

Helen makes \$45 per hour and she works 37.50 hours per week.

- a. How much money does she make per year? 87,750
- b. How much does she pay in federal tax?. 13,162
- 74,588

Answers to Binomial Expansion Practice

1) 96

2) 60

3) 75

4) 90

5) 24

6) $64y^{18} - 192y^{15} + 240y^{12} - 160y^9 + 60y^6 - 12y^3 + 1$

7) $v^{10} - 10v^8 + 40v^6 - 80v^4 + 80v^2 - 32$

8) $b^5 + 5b^4a + 10b^3a^2 + 10b^2a^3 + 5ba^4 + a^5$

9) $81v^{16} - 216v^{12}u^2 + 216v^8u^4 - 96v^4u^6 + 16u^8$

10) $x^5 - 15x^4y + 90x^3y^2 - 270x^2y^3 + 405xy^4 - 243y^5$

11) $32n^{20} - 80n^{16}m + 80n^{12}m^2 - 40n^8m^3 + 10n^4m^4 - m^5$

12) $8y^{12} - 36y^8x^3 + 54y^4x^6 - 27x^9$

② $(2+x)^6$

$$1 \binom{6}{0} (2)^6 (x)^0 + 6 \binom{5}{1} (2)^5 (x)^1 + 15 \binom{4}{2} (2)^4 (x)^2 + 20 \binom{3}{3} (2)^3 (x)^3 + 15 \binom{2}{4} (2)^2 (x)^4 + 6 \binom{1}{5} (2)^1 (x)^5 + 1 \binom{0}{6} (2)^0 (x)^6$$

$15 (2)^2 (x^4)$
 $60x^4$

⑥ $(2y^3 - 1)^6$

$$1 \binom{6}{0} (2y^3)^6 (-1)^0 + 6 \binom{5}{1} (2y^3)^5 (-1)^1 + 15 \binom{4}{2} (2y^3)^4 (-1)^2 + 20 \binom{3}{3} (2y^3)^3 (-1)^3 + 15 \binom{2}{4} (2y^3)^2 (-1)^4 + 6 \binom{1}{5} (2y^3)^1 (-1)^5 + 1 \binom{0}{6} (2y^3)^0 (-1)^6$$

$$64y^{18} - 192y^{15} + 240y^{12} - 160y^9 + 60y^6 - 12y^3 + 1$$

$$\begin{array}{r} 192,364 \\ \hline 26 \end{array}$$

$$\begin{array}{r} 4 \\ 26 \\ \hline 7 \\ 182 \end{array} \quad \begin{array}{r} 1 \\ 26 \\ \hline 3 \\ 78 \end{array}$$

$$\begin{array}{r} 7398 \frac{16}{26} \\ \hline 26 \overline{) 192364.0} \\ \underline{-182} \downarrow \\ 103 \\ \underline{-78} \\ 256 \\ \underline{234} \\ 224 \\ \underline{208} \\ 16 \end{array}$$

<p>÷ Divide ÷</p> <p>Leading term inside/L.T. Outside</p>
<p>• Multiply •</p> <p>on top by all of outside.</p>
<p>- Subtract -</p> <p>Change signs on bottom, then Add</p>
<p> Bring Down </p>
<p>Repeat</p>

$$\begin{array}{r}
 8x^3 - 46x^2 - 7x - 30 \\
 \hline
 \begin{array}{l}
 x-6 \\
 \hline
 8x^2 + 2x + 5
 \end{array} \\
 \hline
 x-6 \) \ 8x^3 - 46x^2 - 7x - 30 \\
 \underline{-8x^3 + 48x^2} \\
 2x^2 - 7x \\
 \underline{-2x^2 + 12x} \\
 5x - 30 \\
 \underline{-5x + 30} \\
 0
 \end{array}$$

← Answer

$$\begin{array}{r}
 \frac{8x^3}{x} = 8x^2 \\
 8x^2(x-6) \\
 8x^3 - 48x^2 \\
 \hline
 \frac{2x^2}{x} = 2x \\
 2x(x-6) \\
 2x^2 - 12x
 \end{array}$$

÷ Divide ÷
• Multiply •
- Subtract -
↓ Bring Down ↓
Repeat

$$(7x^3 - 17x^2 + 23x + 14) \div (7x + 4)$$

$$x^2 - 3x + 5 - \frac{6}{7x+4}$$

$$\begin{array}{r} 7x+4 \overline{) 7x^3 - 17x^2 + 23x + 14} \\ \underline{-7x^3 + 4x^2} \\ -21x^2 + 23x \\ \underline{+21x^2 + 12x} \\ 35x + 14 \\ \underline{-35x + 20} \\ -6 \end{array}$$

Remainder \rightarrow $\boxed{-6}$

$$\frac{-6}{7x} = 5 \frac{35x + 20}{7x}$$

$$\frac{7x^3}{7x} = x^2$$

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

$$\frac{-21x^2}{7x} = -3x$$

$$\frac{-3x(7x+4)}{-21x^2 - 12x}$$