



Find each product.

$$1) \left(3a + 2\frac{3}{4}b\right)\left(\frac{1}{3}a^2 - 1\frac{8}{9}ab + \frac{1}{2}b^2\right)$$

$$2) \left(1\frac{1}{3}x + \frac{1}{3}y\right)\left(xy + 1\frac{1}{8}x^2 - 3\frac{1}{2}y^2\right)$$

$$3) \left(2b + 5\frac{4}{9}a\right)\left(4\frac{2}{3}a^2 - 3\frac{3}{4}ab - 2\frac{1}{3}b^2\right)$$

$$4) \left(\frac{1}{3}x - 1\frac{1}{2}y\right)\left(5\frac{7}{10}x^2 + \frac{2}{9}xy - 1\frac{1}{2}y^2\right)$$

$$5) \left(\frac{8}{9}m + \frac{2}{3}n\right)\left(m^2 - 2\frac{1}{3}mn + 9\frac{7}{10}n^2\right)$$

$$6) \left(\frac{1}{2}m + 1\frac{2}{3}n\right)\left(mn + \frac{3}{5}m^2 - 1\frac{3}{4}n^2\right)$$

7)  $\left(4\frac{2}{7}x + 2\frac{2}{3}y\right)\left(4\frac{5}{7}x^2 + 1\frac{1}{2}xy + 1\frac{4}{5}y^2\right)$

8)  $\left(3\frac{1}{4}x - 2\frac{1}{5}y\right)\left(5\frac{1}{10}x^2 + 1\frac{1}{3}xy + 3\frac{1}{10}y^2\right)$

9)  $\left(-5n + \frac{3}{10}m\right)\left(\frac{9}{10}m^2 + 4\frac{8}{9}mn + 2\frac{5}{9}n^2\right)$

10)  $\left(\frac{1}{7}x - 1\frac{1}{3}y\right)\left(1\frac{1}{7}x^2 - \frac{1}{9}xy + 1\frac{9}{10}y^2\right)$

11)  $\left(2u + \frac{1}{10}v\right)\left(-10v^2 - 5uv + \frac{2}{3}u^2\right)$

12)  $\left(1\frac{3}{8}x - 8\frac{1}{5}y\right)\left(2\frac{9}{10}x^2 - 1\frac{3}{8}xy + 5\frac{5}{6}y^2\right)$

$$13) \left(6y + 4\frac{1}{2}x\right)\left(1\frac{1}{3}x^2 - \frac{1}{2}xy + \frac{1}{2}y^2\right)$$

$$14) \left(4\frac{5}{6}a + 3\frac{7}{8}b\right)\left(1\frac{4}{9}a^2 + \frac{3}{4}ab + \frac{1}{5}b^2\right)$$

$$15) \left(2x + 1\frac{1}{3}y\right)\left(2y^2 + 1\frac{5}{7}x^2 - 7\frac{1}{2}xy\right)$$

$$16) \left(-2v + \frac{1}{10}u\right)\left(\frac{5}{8}u^2 + 2\frac{3}{10}uv - 1\frac{1}{2}v^2\right)$$

$$17) \left(1\frac{1}{4}x - 2\frac{2}{7}y\right)\left(\frac{1}{9}x^2 + 1\frac{1}{8}xy - 1\frac{1}{2}y^2\right)$$

$$18) \left(-5n + 4\frac{2}{7}m\right)\left(-mn + 1\frac{1}{5}m^2 - 3\frac{3}{10}n^2\right)$$

19)  $\left(\frac{1}{2}a - 1\frac{2}{3}b\right)\left(5\frac{1}{9}a^2 + 2\frac{3}{10}ab - 2\frac{7}{10}b^2\right)$

20)  $\left(\frac{2}{9}x + 1\frac{1}{2}y\right)\left(\frac{1}{3}x^2 + 2\frac{1}{4}xy - 1\frac{3}{8}y^2\right)$

21)  $\left(\frac{2}{3}m + 4\frac{3}{4}n\right)\left(1\frac{3}{5}m^2 - 3\frac{3}{4}mn - 1\frac{4}{7}n^2\right)$

22)  $\left(2y + \frac{3}{5}x\right)\left(-6xy + 1\frac{3}{5}x^2 - \frac{2}{5}y^2\right)$

23)  $\left(8x - 1\frac{9}{10}y\right)\left(5\frac{2}{3}x^2 + 4\frac{1}{3}xy + 2\frac{3}{5}y^2\right)$

24)  $\left(5\frac{1}{2}x - \frac{1}{2}y\right)\left(2\frac{5}{8}x^2 - \frac{8}{9}xy - \frac{1}{5}y^2\right)$

$$25) \left(x + \frac{3}{4}y\right)\left(y^2 + 2x^2 - 1\frac{1}{5}xy\right)$$

$$26) \left(4\frac{5}{6}x - \frac{3}{8}y\right)\left(4\frac{9}{10}x^2 - 2\frac{1}{2}xy - 3\frac{1}{8}y^2\right)$$

$$27) \left(2u - 2\frac{1}{2}v\right)\left(3\frac{5}{7}u^2 + \frac{3}{5}uv - 3\frac{1}{2}v^2\right)$$

$$28) \left(1\frac{1}{9}x - \frac{1}{2}y\right)\left(y^2 + 1\frac{5}{8}x^2 + 3\frac{5}{8}xy\right)$$

$$29) \left(x - \frac{2}{3}y\right)\left(-2y^2 + 1\frac{1}{2}x^2 + \frac{1}{4}xy\right)$$

$$30) \left(\frac{2}{7}u - 3\frac{5}{6}v\right)\left(-uv + 1\frac{2}{3}u^2 - 1\frac{3}{7}v^2\right)$$

$$1) a^3 - 4\frac{3}{4}a^2b - 3\frac{25}{36}ab^2 + 1\frac{3}{8}b^3$$

$$3) -11\frac{1}{12}ba^2 - 20\frac{11}{54}b^2a - 4\frac{2}{3}b^3 + 25\frac{11}{27}a^3$$

$$5) \frac{8}{9}m^3 - 1\frac{11}{27}m^2n + 7\frac{1}{15}mn^2 + 6\frac{7}{15}n^3$$

$$7) 20\frac{10}{49}x^3 + 19x^2y + 11\frac{5}{7}xy^2 + 4\frac{4}{5}y^3$$

$$9) -3\frac{1}{30}nm^2 - 23\frac{61}{90}n^2m - 12\frac{7}{9}n^3 + \frac{27}{100}m^3$$

$$11) -20\frac{1}{2}uv^2 - 9\frac{14}{15}u^2v + 1\frac{1}{3}u^3 - v^3$$

$$13) 5\frac{3}{4}yx^2 - \frac{3}{4}y^2x + 3y^3 + 6x^3$$

$$15) -6xy^2 + 3\frac{3}{7}x^3 - 12\frac{5}{7}x^2y + 2\frac{2}{3}y^3$$

$$17) \frac{5}{36}x^3 + 1\frac{307}{2016}x^2y - 4\frac{25}{56}xy^2 + 3\frac{3}{7}y^3$$

$$19) 2\frac{5}{9}a^3 - 7\frac{199}{540}a^2b - 5\frac{11}{60}ab^2 + 4\frac{1}{2}b^3$$

$$21) 1\frac{1}{15}m^3 + 5\frac{1}{10}m^2n - 18\frac{289}{336}mn^2 - 7\frac{13}{28}n^3$$

$$23) 45\frac{1}{3}x^3 + 23\frac{9}{10}x^2y + 12\frac{17}{30}xy^2 - 4\frac{47}{50}y^3$$

$$25) \frac{1}{10}xy^2 + 2x^3 + \frac{3}{10}x^2y + \frac{3}{4}y^3$$

$$27) 7\frac{3}{7}u^3 - 8\frac{3}{35}u^2v - 8\frac{1}{2}uv^2 + 8\frac{3}{4}v^3$$

$$29) -2\frac{1}{6}xy^2 + 1\frac{1}{2}x^3 - \frac{3}{4}x^2y + 1\frac{1}{3}y^3$$

$$2) 1\frac{17}{24}x^2y + 1\frac{1}{2}x^3 - 4\frac{1}{3}xy^2 - 1\frac{1}{6}y^3$$

$$4) 1\frac{9}{10}x^3 - 8\frac{257}{540}x^2y - \frac{5}{6}xy^2 + 2\frac{1}{4}y^3$$

$$6) 1\frac{1}{2}m^2n + \frac{3}{10}m^3 + \frac{19}{24}mn^2 - 2\frac{11}{12}n^3$$

$$8) 16\frac{23}{40}x^3 - 6\frac{133}{150}x^2y + 7\frac{17}{120}xy^2 - 6\frac{41}{50}y^3$$

$$10) \frac{8}{49}x^3 - 1\frac{34}{63}x^2y + \frac{793}{1890}xy^2 - 2\frac{8}{15}y^3$$

$$12) 3\frac{79}{80}x^3 - 25\frac{1073}{1600}x^2y + 19\frac{71}{240}xy^2 - 47\frac{5}{6}y^3$$

$$14) 6\frac{53}{54}a^3 + 9\frac{2}{9}a^2b + 3\frac{419}{480}ab^2 + \frac{31}{40}b^3$$

$$16) -1\frac{1}{50}vu^2 - 4\frac{3}{4}v^2u + 3v^3 + \frac{1}{16}u^3$$

$$18) -9\frac{1}{7}n^2m - 10\frac{2}{7}nm^2 + 16\frac{1}{2}n^3 + 5\frac{1}{7}m^3$$

$$20) \frac{2}{27}x^3 + x^2y + 3\frac{5}{72}xy^2 - 2\frac{1}{16}y^3$$

$$22) -12\frac{6}{25}y^2x - \frac{2}{5}yx^2 - \frac{4}{5}y^3 + \frac{24}{25}x^3$$

$$24) 14\frac{7}{16}x^3 - 6\frac{29}{144}x^2y - \frac{59}{90}xy^2 + \frac{1}{10}y^3$$

$$26) 23\frac{41}{60}x^3 - 13\frac{221}{240}x^2y - 14\frac{1}{6}xy^2 + 1\frac{11}{64}y^3$$

$$28) -\frac{101}{144}xy^2 + 1\frac{29}{36}x^3 + 3\frac{31}{144}x^2y - \frac{1}{2}y^3$$

$$30) -6\frac{85}{126}u^2v + \frac{10}{21}u^3 + 3\frac{125}{294}uv^2 + 5\frac{10}{21}v^3$$