

27E

1) $(2X + 1)(2X + 3) = 0$

$$\begin{array}{l} 2X + 1 = 0 \\ X = -1/2 \end{array} \quad \begin{array}{l} 2X + 3 = 0 \\ X = -3/2 \end{array}$$

2) $4(-1/2)^2 + 8(-1/2) + 3 = 0$

$4(1/4) - 4 + 3 = 0$

$1 - 4 + 3 = 0$

$0 = 0$

$4(-3/2)^2 + 8(-3/2) + 3 = 0$

$4(9/4) - 24/2 + 3 = 0$

$0 = 0$

3) $(X + 3)(X + 4) = 0$

$$\begin{array}{l} X + 3 = 0 \\ X = -3 \end{array} \quad \begin{array}{l} X + 4 = 0 \\ X = -4 \end{array}$$

4) $(-3)^2 + 7(-3) + 12 = 0$

$9 - 21 + 12 = 0$

$0 = 0$

$(-4)^2 + 7(-4) + 12 = 0$

$16 - 28 + 12 = 0$

$0 = 0$

5) $X^2 + X - 12 = 0$

$(X + 4)(X - 3) = 0$

$$\begin{array}{l} X + 4 = 0 \\ X = -4 \end{array} \quad \begin{array}{l} X - 3 = 0 \\ X = 3 \end{array}$$

6) $(-4)^2 + (-4) + 1 = 13$

$16 - 4 + 1 = 13$

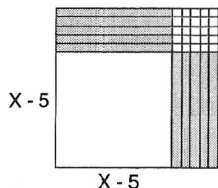
$13 = 13$

$(3)^2 + (3) + 1 = 13$

$9 + 3 + 1 = 13$

$13 = 13$

7) $X^2 - 10X + 25$



$$\begin{array}{r} X^2 - 10X + 25 \\ X^2 - 10X + 25 \\ \hline \end{array}$$

9) $4(4X^2 - 1)$
 $4(2X - 1)(2X + 1)$

10) $(X - 10)(X + 10)$

11) $9 - 25 = -16$

12) $2^{-4+4} = 2^0 = 1$

13) $X^{-6-6} = X^{-12}$

14) $5M^4N^2M^{-1} - 2NM^4N^3M^{-1} =$
 $5M^3N^2 - 2N^4M^3$

15) $8G = 100$
 $G = 25/2 = 12 \frac{1}{2}$

16) $7T = 200$
 $T = 200/7 = 28 \frac{4}{7}$

17) $N^2 + 2N - 2$

18) $N^2 + 2N - 2 = 22$
 $N^2 + 2N - 24 = 0$
 $(N + 6)(N - 4) = 0$
 $N = -6 \text{ or } N = 4$

19) $15Y - 3X = -18$
 $4Y + 3X = -20$
 $19Y = -38$
 $Y = -2$
 $5(-2) - X = -6$
 $-4 = X$

$(-4, -2)$

20) $(X + 2)(3X + 1) = (X)(3X + 1) + (2)(3X + 1)$

28A

1) 1 foot = 12 inches

2) feet in numerator to remain in final answer
inches in denominator so they will cancel

3) $84 \cancel{\text{ft.}} \times \frac{1 \cancel{\text{ft.}}}{12 \cancel{\text{ft.}}} = 7 \text{ ft.}$

4) 3 feet = 1 yard

5) yards in numerator to remain in final answer
feet in denominator so they will cancel

6) $63 \cancel{\text{ft.}} \times \frac{1 \cancel{\text{yd.}}}{3 \cancel{\text{ft.}}} = 21 \text{ yds.}$

7) 1 foot = 12 inches

8) inches in numerator to remain in final answer
feet in denominator so they will cancel

9) $15 \cancel{\text{ft.}} \times \frac{12 \cancel{\text{in.}}}{1 \cancel{\text{ft.}}} = 180 \text{ in.}$

10) 4 quarts = 1 gallon

11) quarts in numerator to remain in final answer
gallons in denominator so they will cancel

12) $25 \cancel{\text{gal.}} \times \frac{4 \cancel{\text{qts.}}}{1 \cancel{\text{gal.}}} = 100 \text{ qts.}$

13) 16 ounces = 1 pound

14) pounds in numerator to remain in final answer
ounces in denominator so they will cancel

15) $272 \cancel{\text{oz.}} \times \frac{1 \cancel{\text{lb.}}}{16 \cancel{\text{oz.}}} = 17 \text{ lbs.}$

16) 4 quarts = 1 gallon

17) gallons in numerator to remain in final answer
quarts in denominator so they will cancel

18) $52 \cancel{\text{qt.}} \times \frac{1 \cancel{\text{gal.}}}{4 \cancel{\text{qt.}}} = 13 \text{ gal.}$

28B

1) 1 meter = 100 centimeters

2) cm in numerator to remain in final answer
meters in denominator so they will cancel

3) $14 \cancel{\text{m.}} \times \frac{100 \cancel{\text{cm}}}{1 \cancel{\text{m}}} = 1,400 \text{ cm}$

4) 1 kilometer = 1,000 meters

5) meters in numerator to remain in final answer
kilometers in denominator so they will cancel

6) $200 \cancel{\text{km}} \times \frac{1000 \cancel{\text{m}}}{1 \cancel{\text{km}}} = 200,000 \text{ m}$

7) 1 dekaliter = 10 liters

8) dekaliters in numerator to remain in final answer
liters in denominator so they will cancel

9) $3,500 \cancel{\text{liters}} \times \frac{1 \cancel{\text{dkl}}}{10 \cancel{\text{liters}}} = 350 \text{ dkl}$

10) 1 liter = 1,000 milliliters

11) liters in numerator to remain in final answer
milliliters in denominator so they will cancel

12) $67,000 \cancel{\text{ml}} \times \frac{1 \cancel{\text{liter}}}{1000 \cancel{\text{ml}}} = 67 \text{ liters}$

13) 1 hectoliter = 100 liters

14) liters in numerator to remain in final answer
hectoliters in denominator so they will cancel

15) $4.5 \cancel{\text{hl}} \times \frac{100 \cancel{\text{liters}}}{1 \cancel{\text{hl}}} = 450 \text{ liters}$

16) 1 gram = 10 decigrams

17) grams in numerator to remain in final answer
decigrams in denominator so they will cancel

18) $790 \cancel{\text{g}} \times \frac{1 \cancel{\text{g}}}{10 \cancel{\text{dg}}} = 79 \text{ g}$

28C

1) 12 inches = 1 foot

2) feet in numerator to remain in final answer
inches in denominator so they will cancel

3) $60 \cancel{\text{in.}} \times \frac{1 \text{ ft.}}{12 \cancel{\text{in.}}} = 5 \text{ ft.}$

4) 3 feet = 1 yard

5) yards in numerator to remain in final answer
feet in denominator so they will cancel

6) $24 \cancel{\text{ft.}} \times \frac{1 \text{ yd.}}{3 \cancel{\text{ft.}}} = 8 \text{ yds.}$

7) 16 ounces = 1 pound

8) pounds in numerator to remain in final answer
ounces in denominator so they will cancel

9) $32 \cancel{\text{oz.}} \times \frac{1 \text{ lb.}}{16 \cancel{\text{oz.}}} = 2 \text{ lbs.}$

10) 4 quarts = 1 gallon

11) gallons in numerator to remain in final answer
quarts in denominator so they will cancel

12) $28 \cancel{\text{qts.}} \times \frac{1 \text{ gal.}}{4 \cancel{\text{qts.}}} = 7 \text{ gal.}$

13)
$$\begin{array}{r} X - 3 \text{ R } 4 \\ X - 2 \overline{) X^2 - 5X + 10} \\ \underline{-(X^2 - 2X)} \\ -3X + 10 \\ \underline{-(-3X + 6)} \\ 4 \end{array}$$

14)
$$\begin{array}{r} X - 2 \\ x \overline{) X - 3} \\ \underline{-3X + 6} \\ X^2 - 2X \\ \underline{X^2 - 5X + 6} \\ + 4 \\ X^2 - 5X + 10 \end{array}$$

15) $(3X + 1)(X + 3)$
 $X = -1/3, X = -3$

16) $3(-1/3)^2 + 10(-1/3) + 3 = 0$
 $3(1/9) - 10/3 + 3 = 0$
 $0 = 0$
 $3(-3)^2 + 10(-3) + 3 = 0$
 $27 - 30 + 3 = 0$
 $0 = 0$

17) $2X^2 - 6X + 10 = 30$
 $2X^2 - 6X - 20 = 0$
 $2(X^2 - 3X - 10) = 0$
 $(X - 5)(X + 2) = 0$
 $X = 5, X = -2$

18) $2(5)^2 - 6(5) + 10 = 30$
 $50 - 30 + 10 = 30$
 $30 = 30$

19) $10Q = (.20)(25)$
 $10Q = 5$
 $Q = 1/2 \text{ or } .5$

20) $AD = BC$
 $A = \frac{BC}{D}$

28D

1) 12 inches = 1 foot

2) inches in numerator to remain in final answer
feet in denominator so they will cancel

3) $4 \cancel{\text{ft.}} \times \frac{12 \text{ in.}}{1 \cancel{\text{ft.}}} = 48 \text{ in.}$

4) 5, 280 feet = 1 mile

5) feet in numerator to remain in final answer
miles in denominator so they will cancel

6) $3 \cancel{\text{mi.}} \times \frac{5,280 \text{ ft.}}{1 \cancel{\text{mi.}}} = 15,840 \text{ ft.}$

7) 2000 lbs. = 1 ton

8) pounds in numerator to remain in final answer
tons in denominator so they will cancel

9) $6 \cancel{\text{tons}} \times \frac{2000 \text{ lb.}}{1 \cancel{\text{ton}}} = 12,000 \text{ lbs.}$

10) 2 pints = 1 quart

11) pints in numerator to remain in final answer
quarts in denominator so they will cancel

12) $2.5 \cancel{\text{qts.}} \times \frac{2 \text{ pt.}}{1 \cancel{\text{qt.}}} = 5 \text{ pt.}$

13) $(2X - 5)(X + 1) = 0$
 $X = 5/2, X = -1$

14) $2(5/2)^2 - 3(5/2) - 5 = 0$
 $25/2 - 15/2 - 5 = 0$
 $0 = 0$

$2(-1)^2 - 3(-1) - 5 = 0$
 $2 + 3 - 5 = 0$
 $0 = 0$

15) $(3X + 2)(X + 2)$
 $X = -2/3, X = -2$

16) $3(-2/3)^2 + 8(-2/3) + 4 = 0$
 $4/3 - 16/3 + 4 = 0$
 $0 = 0$

$3(-2)^2 + 8(-2) + 4 = 0$
 $12 - 16 + 4 = 0$
 $0 = 0$

17) $3(Y^2 - 4) = 0$
 $3(Y - 2)(Y + 2) = 0$
 $Y = 2, Y = -2$

18) $3(2)^2 - 12 = 0$
 $0 = 0$

$3(-2)^2 - 12 = 0$
 $0 = 0$

19) $X = \frac{65 \text{ mi.}}{1 \cancel{\text{hr.}}} \times \frac{3 \cancel{\text{hr.}}}{1} = 195 \text{ mi.}$

20) $X = \frac{45 \text{ mi.}}{1 \cancel{\text{hr.}}} \times \frac{5 \cancel{\text{hr.}}}{1} = 225 \text{ mi.}$

- 1) 12 inches = 1 foot
- 2) inches in numerator to remain in final answer
feet in denominator so they will cancel
- 3) $7,920 \cancel{\text{ft.}} \times \frac{12 \text{ in.}}{1 \cancel{\text{ft.}}} = 95,040 \text{ in.}$
- 4) 2,000 pounds = 1 ton
- 5) tons in numerator to remain in final answer
pounds in denominator so they will cancel
- 6) $10,000 \cancel{\text{lbs.}} \times \frac{1 \text{ ton}}{2000 \cancel{\text{lbs.}}} = 5 \text{ tons}$
- 7) 16 ounces = 1 pound
- 8) ounces in numerator to remain in final answer
pounds in denominator so they will cancel
- 9) $5 \cancel{\text{lbs.}} \times \frac{16 \text{ oz.}}{1 \cancel{\text{lbs.}}} = 80 \text{ oz.}$
- 10) 2 pints = 1 quart
- 11) pints in numerator to remain in final answer
quarts in denominator so they will cancel
- 12) $13 \cancel{\text{qt.}} \times \frac{2 \text{ pt.}}{1 \cancel{\text{qt.}}} = 26 \text{ pt.}$
- 13) $(2X - 3)(X + 2) = 0$
 $X = 3/2, X = -2$
- 14) $2(3/2)^2 + (3/2) - 6 = 0$
 $9/2 + 3/2 - 6 = 0$
 $0 = 0$
 $2(-2)^2 + (-2) - 6 = 0$
 $8 - 2 - 6 = 0$
 $0 = 0$
- 15) $5(b^2 - 25) = 0$
 $5(B - 5)(B + 5) = 0$
 $B = 5, B = -5$
- 16) $5(5)^2 - 125 = 0$
 $5(25) - 125 = 0$
 $0 = 0$
 $5(-5)^2 - 125 = 0$
 $5(25) - 125 = 0$
 $0 = 0$
- 17) $6X^2 - 6X - 72 = 0$
 $6(X^2 - X - 12) = 0$
 $6(X - 4)(X + 3) = 0$
 $X = 4, X = -3$
- 18) $6(4)^2 - 6(4) + 18 = 90$
 $6(16) - 24 + 18 = 90$
 $90 = 90$
 $6(-3)^2 - 6(-3) + 18 = 90$
 $6(9) + 18 + 18 = 90$
 $90 = 90$
- 19) $\frac{X \text{ mi.}}{1 \text{ hr.}} = \frac{6 \text{ mi.}}{.5 \text{ hrs.}}$
 $.5X = 6, X = 12$
 $R = 12 \text{ mph}$
- 20) $R = \frac{10 \text{ mi.}}{.8 \text{ hr.}} = 12.5 \text{ mph}$

- 1) $\frac{1 \cancel{\text{ft.}}^2}{1} \times \frac{12 \text{ in.}}{1 \cancel{\text{ft.}}} \times \frac{12 \text{ in.}}{1 \cancel{\text{ft.}}} = 144 \text{ in.}^2$
- 2) $\frac{2 \cancel{\text{ft.}}^2}{1} \times \frac{12 \text{ in.}}{1 \cancel{\text{ft.}}} \times \frac{12 \text{ in.}}{1 \cancel{\text{ft.}}} = 288 \text{ in.}^2$
- 3) $\frac{1 \cancel{\text{yd.}}^2}{1} \times \frac{3 \text{ ft.}}{1 \cancel{\text{yd.}}} \times \frac{3 \text{ ft.}}{1 \cancel{\text{yd.}}} = 9 \text{ ft.}^2$
- 4) $\frac{1 \cancel{\text{yd.}}^3}{1} \times \frac{36 \text{ in.}}{1 \cancel{\text{yd.}}} \times \frac{36 \text{ in.}}{1 \cancel{\text{yd.}}} \times \frac{36 \text{ in.}}{1 \cancel{\text{yd.}}} = 46,656 \text{ in.}^3$
- 5) $\frac{2 \cancel{\text{ft.}}^3}{1} \times \frac{12 \text{ in.}}{1 \cancel{\text{ft.}}} \times \frac{12 \text{ in.}}{1 \cancel{\text{ft.}}} \times \frac{12 \text{ in.}}{1 \cancel{\text{ft.}}} = 3,456 \text{ in.}^3$
- 6) $\frac{8 \cancel{\text{cm}}^2}{1} \times \frac{10 \text{ mm}}{1 \cancel{\text{cm}}} \times \frac{10 \text{ mm}}{1 \cancel{\text{cm}}} = 800 \text{ mm}^2$
- 7) $\frac{9 \cancel{\text{yd.}}^2}{1} \times \frac{36 \text{ in.}}{1 \cancel{\text{yd.}}} \times \frac{36 \text{ in.}}{1 \cancel{\text{yd.}}} = 11,664 \text{ in.}^2$
- 8) $\frac{1 \cancel{\text{mi.}}^2}{1} \times \frac{5280 \text{ ft.}}{1 \cancel{\text{mi.}}} \times \frac{5280 \text{ ft.}}{1 \cancel{\text{mi.}}} = 27,878,400 \text{ ft.}^2$
- 9) $\frac{100 \cancel{\text{ft.}}^2}{1} \times \frac{1 \text{ yd.}}{3 \cancel{\text{ft.}}} \times \frac{1 \text{ yd.}}{3 \cancel{\text{ft.}}} = 11.11 \text{ yd.}^2$
- 10) $\frac{.5 \cancel{\text{yd.}}^2}{1} \times \frac{3 \text{ ft.}}{1 \cancel{\text{yd.}}} \times \frac{3 \text{ ft.}}{1 \cancel{\text{yd.}}} = 4.5 \text{ ft.}^2$
- 11) $\frac{300 \cancel{\text{ft.}}^2}{1} \times \frac{1 \text{ mi.}}{5280 \cancel{\text{ft.}}} \times \frac{1 \text{ mi.}}{5280 \cancel{\text{ft.}}} = .00001 \text{ mi.}^2$
(rounded)
- 12) $\frac{950 \cancel{\text{cm}}^2}{1} \times \frac{1 \text{ m}}{100 \cancel{\text{cm}}} \times \frac{1 \text{ m}}{100 \cancel{\text{cm}}} = .095 \text{ m}^2$
- 13) 43,560 ft.²
- 14) 4 ft. x 4 ft. x 8 ft. = 128 ft.³
- 15) 27 ft.³
- 16) 9 ft.²

- 1) $\frac{7 \cancel{\text{ft.}}^2}{1} \times \frac{12 \text{ in.}}{1 \cancel{\text{ft.}}} \times \frac{12 \text{ in.}}{1 \cancel{\text{ft.}}} = 1,008 \text{ in.}^2$
- 2) $\frac{3 \cancel{\text{m}}^2}{1} \times \frac{100 \text{ cm}}{1 \cancel{\text{m}}} \times \frac{100 \text{ cm}}{1 \cancel{\text{m}}} = 30,000 \text{ cm}^2$
- 3) $\frac{.8 \cancel{\text{ft.}}^2}{1} \times \frac{12 \text{ in.}}{1 \cancel{\text{ft.}}} \times \frac{12 \text{ in.}}{1 \cancel{\text{ft.}}} = 115.2 \text{ in.}^2$
- 4) $\frac{1.5 \cancel{\text{ft.}}^2}{1} \times \frac{12 \text{ in.}}{1 \cancel{\text{ft.}}} \times \frac{12 \text{ in.}}{1 \cancel{\text{ft.}}} = 216 \text{ in.}^2$
- 5) $\frac{8 \cancel{\text{m}}^3}{1} \times \frac{10 \text{ dm}}{1 \cancel{\text{m}}} \times \frac{10 \text{ dm}}{1 \cancel{\text{m}}} \times \frac{10 \text{ dm}}{1 \cancel{\text{m}}} = 8,000 \text{ dm}^3$
- 6) $\frac{3 \cancel{\text{km}}^3}{1} \times \frac{1000 \text{ m}}{1 \cancel{\text{km}}} \times \frac{1000 \text{ m}}{1 \cancel{\text{km}}} \times \frac{1000 \text{ m}}{1 \cancel{\text{km}}} = 3,000,000,000 \text{ m}^3$
- 7) $\frac{5.6 \cancel{\text{ft.}}^3}{1} \times \frac{12 \text{ in.}}{1 \cancel{\text{ft.}}} \times \frac{12 \text{ in.}}{1 \cancel{\text{ft.}}} \times \frac{12 \text{ in.}}{1 \cancel{\text{ft.}}} = 9,676.8 \text{ in.}^3$
- 8) $\frac{2 \cancel{\text{ft.}}^3}{1} \times \frac{12 \text{ in.}}{1 \cancel{\text{ft.}}} \times \frac{12 \text{ in.}}{1 \cancel{\text{ft.}}} \times \frac{12 \text{ in.}}{1 \cancel{\text{ft.}}} = 3,456 \text{ in.}^3$
- 9) $\frac{7 \cancel{\text{yd.}}^3}{1} \times \frac{36 \text{ in.}}{1 \cancel{\text{yd.}}} \times \frac{36 \text{ in.}}{1 \cancel{\text{yd.}}} \times \frac{36 \text{ in.}}{1 \cancel{\text{yd.}}} = 326,592 \text{ in.}^3$
- 10) $\frac{4 \cancel{\text{mi.}}^3}{1} \times \frac{5280 \cancel{\text{ft.}}}{1 \cancel{\text{mi.}}} \times \frac{5280 \cancel{\text{ft.}}}{1 \cancel{\text{mi.}}} \times \frac{5280 \cancel{\text{ft.}}}{1 \cancel{\text{mi.}}} \times \frac{12 \text{ in.}}{1 \cancel{\text{ft.}}} \times \frac{12 \text{ in.}}{1 \cancel{\text{ft.}}} \times \frac{12 \text{ in.}}{1 \cancel{\text{ft.}}} = 1,017,400,000,000,000 \text{ in.}^3$
- 11) $\frac{370 \cancel{\text{cm}}^3}{1} \times \frac{1 \text{ m}}{100 \cancel{\text{cm}}} \times \frac{1 \text{ m}}{100 \cancel{\text{cm}}} \times \frac{1 \text{ m}}{100 \cancel{\text{cm}}} = .00037 \text{ m}^3$
- 12) $\frac{18 \cancel{\text{cm}}^2}{1} \times \frac{1 \text{ m}}{100 \cancel{\text{cm}}} \times \frac{1 \text{ m}}{100 \cancel{\text{cm}}} = .0018 \text{ m}^2$
- 13) $\frac{2 \cancel{\text{acres}}}{1} \times \frac{43,560 \text{ ft.}^2}{1 \cancel{\text{acre}}} = 87,120 \text{ ft.}^2$
- 14) 4 ft. x 4 ft. x 8 ft. = 128 ft.³
- 15) $\frac{2 \cancel{\text{yards}}}{1} \times \frac{27 \text{ ft.}^3}{1 \cancel{\text{yard}}} = 54 \text{ ft.}^3$
- 16) $\frac{2 \cancel{\text{yards}}}{1} \times \frac{9 \text{ ft.}^2}{1 \cancel{\text{yard}}} = 18 \text{ ft.}^2$