

20F

- 1) $X = 8$
- 2) $R = 7$
- 3) $Y = 56$
- 4) $B = 7$
- 5) $G = 10$
- 6) $.625$
- 7) $.08$
- 8) $\frac{7}{25}$
- 9) $\frac{24}{25}$
- 10) $-2X - X + 12 = X - |-3 \cdot 4|$
 $-3X + 12 = X - 12$
 $12 + 12 = X + 3X$
 $24 = 4X$
 $6 = X$
- 11) $-2(6) - (6) + 12 = (6) - |-3 \cdot 4|$
 $-12 - 6 + 12 = 6 - |-12|$
 $-6 = 6 - 12$
 $-6 = -6$

- 12) $-(6+7)^2 + (10+5)^2 = 5M+1$
 $-(13)^2 + 15^2 = 5M+1$
 $-169 + 225 = 5M+1$
 $56 = 5M+1$
 $55 = 5M$
 $11 = M$
- 13) $-(6+7)^2 + (10+5)^2 = 5(11) + 1$
 $-(13)^2 + (15)^2 = 55 + 1$
 $-169 + 225 = 56$
 $56 = 56$
- 14) 11.72 in.
- 15) $10\frac{3}{6} - 5\frac{1}{6} = 5\frac{2}{6} = 5\frac{1}{3}$ yrs.
- 16) $\frac{3}{8} \times \frac{1}{2} = \frac{3}{16}$
- 17) 32°F
- 18) \$1,200
- 19) $\$1,200 \div 5 = \240 ;
 $\$240 \times 3 = \720
- 20) $2A + 3 - 15 = A$
 $2A - 12 = A$
 $2A - A = 12$
 $A = 12$

21A

- 1) done
- 2) 3, 6, 9, 12, 15, 18, 21, 24, 27, 30
5, 10, 15, 20, 25, 30, 35, 40, 45, 50
LCM = 15
- 3) 4, 8, 12, 16, 20, 24, 28, 32, 36, 40
5, 10, 15, 20, 25, 30, 35, 40, 45, 50
LCM = 20
- 4) done
- 5) $12 = 2 \times 2 \times 3$

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      12
     /  \
    2    6
       /  \
      2    3
  
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- 6) $15 = 3 \times 5$

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      15
     /  \
    3    5
  
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- 7) $8 = 2 \times 2 \times 2$

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      8
     / \
    2   4
       / \
      2  2
  
```
- 8) done
- 9) $2 \times 2 \times 3 = 12$; $3 \times 5 = 15$
LCM = $2 \times 2 \times 3 \times 5 = 60$
- 10) $2 \times 2 \times 2 = 8$; $2 \times 3 \times 3 = 18$
LCM = $2 \times 2 \times 2 \times 3 \times 3 = 72$
- 11) $2 \times 2 \times 2 = 8$; $3 \times 5 = 15$
LCM = $2 \times 2 \times 2 \times 3 \times 5 = 120$
- 12) $1 \times 5 = 5$; $2 \times 2 \times 2 = 8$
LCM = $2 \times 2 \times 2 \times 5 = 40$
- 13) $2 \times 2 = 4$; $3 \times 3 = 9$
LCM = $2 \times 2 \times 3 \times 3 = 36$
- 14) $1 \times 3 = 3$; $2 \times 2 = 4$
LCM = $2 \times 2 \times 3 = 12$
- 15) $8 = 2 \times 2 \times 2$; $12 = 2 \times 2 \times 3$
LCM = $2 \times 2 \times 2 \times 3 = 24$

21B

- 1) 4, 8, 12, 16, 20, 24, 28, 32, 36, 40
8, 16, 24, 32, 40, 48, 56, 64, 72, 80
LCM = 8
- 2) 6, 12, 18, 24, 30, 36, 42, 48, 54, 60
10, 20, 30, 40, 50, 60, 70, 80, 90, 100
LCM = 30
- 3) 4, 8, 12, 16, 20, 24, 28, 32, 36, 40
5, 10, 15, 20, 25, 30, 35, 40, 45, 50
LCM = 20
- 4) $24 = 2 \times 2 \times 2 \times 3$ $\longrightarrow$

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      24
     /  \
    2    12
       /  \
      2    6
         /  \
        2    3
  
```
- 5) $64 = 2 \times 2 \times 2 \times 2 \times 2 \times 2$

```

      64
     /  \
    2    32
       /  \
      2    16
         /  \
        2    8
           /  \
          2    4
             /  \
            2    2
  
```
- 6) $32 = 2 \times 2 \times 2 \times 2 \times 2$

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      32
     /  \
    2    16
       /  \
      2    8
         /  \
        2    4
           /  \
          2    2
  
```
- 7) $20 = 2 \times 2 \times 5$

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      20
     /  \
    2    10
       /  \
      2    5
  
```

```

      8
     / \
    2   4
       / \
      2  2
  
```
- 8) $2 \times 2 \times 5 = 20$; $2 \times 2 \times 2 \times 3 = 24$
LCM = $2 \times 2 \times 2 \times 3 \times 5 = 120$
- 9) $2 \times 2 \times 5 = 20$; $2 \times 2 \times 2 \times 2 \times 2 = 32$
LCM = $2 \times 2 \times 2 \times 2 \times 2 \times 5 = 160$
- 10) $2 \times 2 \times 2 \times 3 = 24$; $2 \times 2 \times 2 \times 2 \times 2 \times 2 = 64$
LCM = $2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 = 192$
- 11) $2 \times 2 \times 2 \times 2 \times 2 = 32$; $2 \times 2 \times 2 \times 2 \times 2 \times 2 = 64$
LCM = $2 \times 2 \times 2 \times 2 \times 2 \times 2 = 64$
- 12) $2 \times 3 = 6$; $2 \times 2 \times 3 = 12$
LCM = $2 \times 2 \times 3 = 12$
- 13) $1 \times 5 = 5$; $1 \times 7 = 7$; LCM = $5 \times 7 = 35$
- 14) $3 \times 3 = 9$; $2 \times 2 \times 3 = 12$
LCM = $2 \times 2 \times 3 \times 3 = 36$
- 15) $3 \times 1 = 3$; $3 \times 5 = 15$; LCM = $3 \times 5 = 15$

21C

- 1) 7, 14, 21, 28, 35, 42, 49, 56, 63, 70
8, 16, 24, 32, 40, 48, 56, 64, 72, 80
LCM = 56
- 2) 3, 6, 9, 12, 15, 18, 21, 24, 27, 30
7, 14, 21, 28, 35, 42, 49, 56, 63, 70
LCM = 21
- 3) 2, 4, 6, 8, 10, 12, 14, 16, 18, 20
5, 10, 15, 20, 25, 30, 35, 40, 45, 50
LCM = 10
- 4) $2 \times 2 \times 2 \times 2 = 16 \longrightarrow 16$

$$\begin{array}{c} 16 \\ / \quad \backslash \\ 2 \quad 8 \\ \quad / \quad \backslash \\ \quad 2 \quad 4 \\ \quad \quad / \quad \backslash \\ \quad \quad 2 \quad 2 \end{array}$$
- 5) $5 \times 5 = 25 \longrightarrow 25$

$$\begin{array}{c} 25 \\ / \quad \backslash \\ 5 \quad 5 \end{array}$$
- 6) $2 \times 5 = 10 \longrightarrow 10$

$$\begin{array}{c} 10 \\ / \quad \backslash \\ 2 \quad 5 \end{array}$$
- 7) $2 \times 2 \times 7 = 28 \longrightarrow 28$

$$\begin{array}{c} 28 \\ / \quad \backslash \\ 2 \quad 14 \\ \quad / \quad \backslash \\ \quad 2 \quad 7 \end{array}$$
- 8) $2 \times 2 \times 2 \times 2 = 16$; $5 \times 5 = 25$
LCM = $2 \times 2 \times 2 \times 2 \times 5 \times 5 = 400$
- 9) $5 \times 5 = 25$; $2 \times 5 = 10$
LCM = $2 \times 5 \times 5 = 50$
- 10) $2 \times 5 = 10$; $2 \times 2 \times 7 = 28$
LCM = $2 \times 2 \times 5 \times 7 = 140$
- 11) $2 \times 2 \times 2 \times 2 = 16$; $2 \times 2 \times 7 = 28$
LCM = $2 \times 2 \times 2 \times 2 \times 7 = 112$
- 12) $2 \times 5 = 10$; $3 \times 5 = 15$
LCM = $2 \times 3 \times 5 = 30$
- 13) $2 \times 2 \times 2 = 8$; $3 \times 3 = 9$
LCM = $2 \times 2 \times 2 \times 3 \times 3 = 72$
- 14) $1 \times 11 = 11$; $2 \times 2 \times 3 = 12$
LCM = $2 \times 2 \times 3 \times 11 = 132$
- 15) $5 \times 1 = 5$; $2 \times 3 = 6$
LCM = $2 \times 3 \times 5 = 30$

21D

- 1) 2×11
- 2) $2 \times 2 \times 7$
- 3) $3 \times 3 \times 5$
- 4) $2 \times 2 \times 3 \times 3$
- 5) $2 \times 3 = 6$; $3 \times 3 = 9$
LCM = $2 \times 3 \times 3 = 18$
- 6) $2 \times 2 = 4$; $3 \times 5 = 15$
LCM = $2 \times 2 \times 3 \times 5 = 60$
- 7) $5 \times 1 = 5$; $3 \times 3 = 9$
LCM = $3 \times 3 \times 5 = 45$
- 8) $2 \times 2 \times 2 = 8$; $2 \times 2 \times 5 = 20$
LCM = $2 \times 2 \times 2 \times 5 = 40$
- 9) $\frac{6}{8} = \frac{X}{16}$; $X = 12$ Remember that there is more than one way to set up the ratio, and more than one way to solve the ratio once it is set up. We will only show one example here.
- 10) $\frac{Y}{18} = \frac{5}{15}$; $Y = 6$
- 11) $|-5| = 5$
- 12) $|-3| = -3$
- 13) $1 \div 5 = .20 = 20\%$
- 14) $6 \div 100 = .06 = 6\%$
- 15) $5 \div 8 = .62\frac{1}{2} = 62\frac{1}{2}\%$
- 16) $25 \div 100 = .25 = 25\%$
- 17) $\frac{2}{8} = \frac{X}{32}$; $X = \$8$
- 18) $8^2 + 10^2 = 15^2$
 $64 + 100 = 225$
 $164 \neq 225$; no

21E

- 1) 2×3
- 2) 2×7
- 3) $2 \times 2 \times 2 \times 2 \times 3$
- 4) $2 \times 5 = 10$; $2 \times 2 \times 3 = 12$
LCM = $2 \times 2 \times 3 \times 5 = 60$
- 5) $3 \times 3 = 9$; $2 \times 5 = 10$
LCM = $2 \times 3 \times 3 \times 5 = 90$
- 6) $2 \times 2 \times 3 = 12$; $2 \times 2 \times 2 \times 2 \times 3 = 48$
LCM = $2 \times 2 \times 2 \times 2 \times 3 = 48$
- 7) $\frac{5}{10} = \frac{A}{12}$; $A = 6$
- 8) $\frac{6}{6} = \frac{B}{9}$; $B = 9$
- 9) done
- 10) $3.56 \div .5 = 7.12$
- 11) $6 \div 7 = .86$ (rounded)
- 12) $2 \div 5 = .40 = 40\%$
- 13) $1 \div 4 = .25 = 25\%$
- 14) $1 \div 3 = .33\frac{1}{3}$ (rounded) = $33\frac{1}{3}\%$
- 15) $\frac{9}{5} \times 25^\circ = 45$; $45 + 32 = 77^\circ$
- 16) $30^\circ - 32 = -2$; $-2 \times \frac{5}{9} = -1.1^\circ$ rounded
- 17) $\$65.35 + \$4.50 = \$69.85$
- 18) $\frac{1}{4} = \frac{X}{2}$; $4X = 2$; $X = \frac{1}{2}$ gallon
- 19) $6^2 + 8^2 = H^2$
 $36 + 64 = H^2$
 $100 = H^2$
 $10 \text{ ft} = H$
- 20) $20 \div 5 = 4$; $4 \times 4 = 16$ brought umbrellas
 $20 - 16 = 4$ did not bring umbrellas

21F

- 1) 2×17
- 2) $2 \times 2 \times 2 \times 5$
- 3) $2 \times 3 \times 3 \times 3$
- 4) $2 \times 7 = 14$; $2 \times 2 \times 7 = 28$
LCM = $2 \times 2 \times 7 = 28$
- 5) $3 \times 1 = 3$; $2 \times 2 \times 2 \times 2 = 16$
LCM = $2 \times 2 \times 2 \times 2 \times 3 = 48$
- 6) $3 \times 5 = 15$; $2 \times 2 \times 2 \times 5 = 40$
 $2 \times 2 \times 2 \times 3 \times 5 = 120$
- 7) $1.5 \times 3 = 4.5$; $2.3 \times 3 = R$
 $R = 6.9$
- 8) $\frac{5}{.2} = \frac{E}{1}$; $E = .5 \div .2 = 2.5$
- 9) $7 \div 8 = .875$
- 10) $1.3 \div .25 = 5.2$
- 11) $10 \div .3 = 33.33$ rounded
- 12) $3 \div 4 = .75 = 75\%$
- 13) $5 \div 8 = .62\frac{1}{2} = 62\frac{1}{2}\%$
- 14) $1 \div 100 = .01 = 1\%$
- 15) $\frac{20}{1} = \frac{X}{5}$; $X = 20 \times 5 = 100$ mi.
- 16) $12^2 + 9^2 = H^2$
 $144 + 81 = H^2$
 $225 = H^2$
 $15 \text{ mi.} = H$
 $15 + 12 = 27$ mi. total
- 17) $\frac{5}{20} + \frac{12}{20} + \frac{3}{20} = \frac{20}{20}$; yes
- 18) $230^\circ - 32 = 198$; $198 \times \frac{5}{9} = 110^\circ$ (110.9°)
- 19) $4 \times 4 = 16$; $4(6 \times 4 \times \frac{1}{2}) = 48$
 $16 + 48 = 64$ sq. ft.
- 20) $2X + 8 = 16$
 $2X = 16 - 8$
 $2X = 8$
 $X = 4$