

# Warm-Up 1

## Answers

1. 81	(C, F, P, S, T)	5. 2000	(C, F, M)	8. 2880 or 2880.00	(C)
2. 121	(C)	6. 60	(C, F, P)	9. 7.5	(C)
3. 12	(C, F)	7. 5	(C, F, P)	10. 12	(C, F, G, T)
4. 9	(C, E, G, T)				

# Warm-Up 2

## Answers

1. 8	(C, F, M)	5. 176 or 176.00	(C, F)	8. 0	(C)
2. 55	(C, F, M, S)	6. $15\frac{1}{4}$	(C, M)	9. 8	(C, E, F, G, S, T)
3. 1024	(C, M, P, S, T)	7. 1*	(C, G, M, P, S, T)	10. 20	(C, M, S)
4. 29 or 29.00	(C, F)				

# Workout 1

## Answers

1. 83	(C, F, G)	5. 38.5	(C, F, M)	8. 119	(C, F, M, S)
2. 25.50	(C)	6. 151.58	(C, F)	9. 700 or 700.00	(C, F, M)
3. $\sqrt{5}$	(C, E, G)	7. 72	(C, F, S)	10. $\frac{4}{3}$	(C, F)
4. 3920	(C, F, M)				

# Warm-Up 3

## Answers

1. $49\pi$	(F, M)	5. 34	(C, F, M, T)	8. 24	(C, F, M)
2. 5	(C, M, P, S, T)	6. gray	(P, S)	9. $\frac{7}{12}$	(C, M, P, T)
3. 30	(C, F, G, M, T)	7. 10	(C, F, G, P, S, T)	10. 2	(C, M, P, S, T)
4. -2	(C, P)				

\* The plural form of the units will always be provided in the answer blank even if the answer appears to require the singular form of units.

# Warm-Up 4

## Answers

- |                          |                       |                   |
|--------------------------|-----------------------|-------------------|
| 1. 25 or 25.00 (F, M, P) | 5. 66 (C, M, P, S, T) | 8. $2^4$ (C)      |
| 2. $4\pi$ (C, F, M, S)   | 6. 26 (M, P, S, T)    | 9. 4 (C, F, M, T) |
| 3. 12 (C, F, P, S, T)    | 7. 2 (C, M, P, T)     | 10. 0 (C, F, M)   |
| 4. 2 (C, F, G, S, T)     |                       |                   |

# Workout 2

## Answers

- |                   |                      |                   |
|-------------------|----------------------|-------------------|
| 1. 1178 (C, T)    | 5. 9 (C, E, F, G, T) | 8. 45 (C, F)      |
| 2. 9 (C, E, G)    | 6. 25 (C, F, G, S)   | 9. 226.80 (C)     |
| 3. 3600 (C, F, M) | 7. 231 (C, F)        | 10. 153 (C, F, P) |
| 4. 50 (C)         |                      |                   |

# Warm-Up 5

## Answers

- |                          |                         |                               |
|--------------------------|-------------------------|-------------------------------|
| 1. 17 (C, E, M, G, T)    | 5. 65 (C, F, G, M, P)   | 8. $\frac{1}{4}$ (C, F, M, S) |
| 2. 8 (C, F, M)           | 6. 96 (C, F, M, P, S)   | 9. 100 (C, F, M, P, S)        |
| 3. 225 (C, F, M)         | 7. 1.86 or +1.86 (C, F) | 10. 21 (C, E, F, G, M, P, T)  |
| 4. 24 (C, F, M, P, S, T) |                         |                               |

# Warm-Up 6

## Answers

1. 25	(C, F, P, T)	5. 238	(C, M, P, S)	8. $\frac{1}{12}$	(C, F, G, M, P)
2. 16	(E, G, M, T)	6. $\frac{1}{4}$	(C, S)	9. 48	(C, F, M)
3. $\frac{1}{2}$	(C, F, M, S, T)	7. 6	(C, F, M)	10. 5	(C, F, M, S)
4. $\frac{2}{3}$	(C, F, G, S)				

# Workout 3

## Answers

1. 1	(M, F, G)	5. 2.9	(C, F, M)	8. -1	(C, E, F, G, T)
2. 1.26	(C, F, M)	6. 5	(C, G)	9. 37.5	(C, F, T)
3. 1004	(C, F)	7. 15	(C, F, M, P, T)	10. 28.4	(C, F, M)
4. 60	(C, T)				

# Proportional Reasoning Stretch

## Answers

1. 51	(C, F, M)	5. 450	(C, F, M)	8. 8	(C, F, G)
2. 27	(C, F, M)	6. 28	(C, F, M)	9. $\frac{1}{9}$	(C, F, M, S)
3. 1071	(C, F, M)	7. 72.5	(C, F)	10. 15	(C, G, M, T)
4. 180	(C, F, M)				

# Warm-Up 7

## Answers

- |                  |           |                  |              |                 |           |
|------------------|-----------|------------------|--------------|-----------------|-----------|
| 1. 360           | (C)       | 5. $\frac{5}{9}$ | (C, F, G)    | 8. 32           | (C, F, T) |
| 2. 81            | (C, F)    | 6. 9             | (C, P, S, T) | 9. 750          | (C)       |
| 3. $6\sqrt{3}$   | (C, F, M) | 7. 144           | (C, P, S, T) | 10. 31 or 31.00 | (C)       |
| 4. $\frac{1}{6}$ | (C, S, T) |                  |              |                 |           |

# Warm-Up 8

## Answers

- |                    |                 |                 |           |                  |           |
|--------------------|-----------------|-----------------|-----------|------------------|-----------|
| 1. $\frac{11}{36}$ | (C, P, S, T)    | 5. 5            | (C, E)    | 8. $12\sqrt{10}$ | (C, F, M) |
| 2. 3               | (C, F)          | 6. 120          | (C, F, M) | 9. 68            | (C, F, M) |
| 3. 9               | (C, G, P, S, T) | 7. $32\sqrt{3}$ | (C, F, M) | 10. 360          | (F, M, S) |
| 4. 240             | (C, M, T)       |                 |           |                  |           |

# Workout 4

## Answers

- |                             |           |               |                 |        |              |
|-----------------------------|-----------|---------------|-----------------|--------|--------------|
| 1. 61                       | (C, F)    | 5. 6          | (C, G, P, T)    | 8. 163 | (C, F, M)    |
| 2. 0                        | (C, P)    | 6. 668        | (C, G, P, S, T) | 9. 2.6 | (C, F, M, P) |
| 3. 45                       | (C, P, T) | 7. 44,928,000 | (C, F)          | 10. 16 | (C)          |
| 4. 460,000 or<br>460,000.00 | (C, T)    |               |                 |        |              |

# Warm-Up 9

## Answers

- |        |              |        |                    |                                   |                    |
|--------|--------------|--------|--------------------|-----------------------------------|--------------------|
| 1. 10  | (F, M, P, T) | 5. 195 | (C, M, T)          | 8. $\frac{9}{25}$                 | (C, S)             |
| 2. 105 | (C, F, M, S) | 6. 8   | (C, F, G, T)       | 9. 4                              | (C, F, G, P, S, T) |
| 3. 72  | (C, G, P, T) | 7. $d$ | (C, E, M, P, S, T) | 10. $(\frac{3}{2}, \frac{27}{4})$ | (C, F, G, T)       |
| 4. 81  | (C, F, M)    |        |                    |                                   |                    |

# Warm-Up 10

## Answers

- |                               |                        |                     |
|-------------------------------|------------------------|---------------------|
| 1. 8 (C, F, G, P, S, T)       | 5. 200 (C, F, G)       | 8. 49 (C, F, P)     |
| 2. 576 (C, E, F, G, M, T)     | 6. 729 (C, F, P)       | 9. 98,634 (S)       |
| 3. $\frac{391}{39}$ (C, F, M) | 7. 200 (C, F, G, M, T) | 10. 60 (C, P, S, T) |
| 4. 42 or 42.00 (C, F, T)      |                        |                     |

# Workout 5

## Answers

- |                        |                            |                      |
|------------------------|----------------------------|----------------------|
| 1. 7397 (C, F, T)      | 5. 0 (C)                   | 8. 1214 (C, F, M)    |
| 2. 346.4 (C, F, M)     | 6. 110 (C, E, P, T)        | 9. 8 (C, F, G, M)    |
| 3. 6.25 (C)            | 7. 16,777,216 (C, M, P, T) | 10. 126 (C, F, M, T) |
| 4. 290 (C, F, M, P, T) |                            |                      |

# Warm-Up 11

## Answers

- |                          |                            |                    |
|--------------------------|----------------------------|--------------------|
| 1. $64 - 4\pi$ (C, F, M) | 5. 22 (C, F, M, S)         | 8. 15 (C, F, M, S) |
| 2. 2 (P, S, T)           | 6. $\frac{1}{2}$ (C, S, T) | 9. 19 (E, G, M, T) |
| 3. 7 (E, P, T)           | 7. 16 (C, F, M)            | 10. 50:3 (C, M, S) |
| 4. 13 (C, F, M)          |                            |                    |

# Warm-Up 12

## Answers

- |                        |                       |                     |
|------------------------|-----------------------|---------------------|
| 1. 75 (C, F)           | 5. $832\pi$ (C, F, M) | 8. 27 (C, G, M, T)  |
| 2. 84 (C, F, M)        | 6. 47 (C, F, P, S)    | 9. 3 (C, M, T)      |
| 3. 128 (C, F, G, M, T) | 7. -14 (C, F, G, M)   | 10. 72 (C, F, M, S) |
| 4. 24 (C, F, M)        |                       |                     |

# Workout 6

## Answers

- |                                   |                   |                       |
|-----------------------------------|-------------------|-----------------------|
| 1. 14.5 (C, E, F, G, M, T)        | 5. 5.4 (C, F, M)  | 8. 15.42 (C, G, M, T) |
| 2. $\frac{3}{16}$ (C, E, G, M, T) | 6. 402.2 (C, F)   | 9. 10.7 (C, F, M)     |
| 3. $1.8396 \times 10^7$ (C)       | 7. 36.3 (C, F, M) | 10. 23 (C, G)         |
| 4. 28 (C, F, M)                   |                   |                       |

# Warm-Up 13

## Answers

- |                  |                           |                           |
|------------------|---------------------------|---------------------------|
| 1. 24 (C, G)     | 5. 9 or 9.00 (C)          | 8. $\frac{30}{49}$ (C, F) |
| 2. 24 (C, F, M)  | 6. $12\sqrt{3}$ (F, M)    | 9. 3 (C)                  |
| 3. 32 (M, S)     | 7. 668 (C, E, G, M, S, T) | 10. 8 (C, P, T)           |
| 4. 4.5 (C, F, M) |                           |                           |

# Warm-Up 14

## Answers

- |                  |                       |                             |
|------------------|-----------------------|-----------------------------|
| 1. 15* (G, P)    | 5. 48 (G, M, T)       | 8. 35 (C, M)                |
| 2. 13 (C, S)     | 6. 36 (C, F, M, P, S) | 9. 19 (T)                   |
| 3. -12 (C, F, G) | 7. 22 (C, F, M)       | 10. $\frac{1}{2}$ (C, G, T) |
| 4. 16 (C, E, T)  |                       |                             |

\*Because the rule was not defined, it may be possible to find another rule that works for all five examples given.

# Workout 7

## Answers

- |                       |                   |  |
|-----------------------|-------------------|--|
| 1. 2457 (C, F, P, S)  | 5. 10.5 (C, F, M) | 8. 1,472,981 (C, M, P, T)                    |
| 2. 56 (F)             | 6. 104 (C, F, M)  | 9. $1+\sqrt{3}$ (C, F, M)<br>or $\sqrt{3}+1$ |
| 3. 16.30 (E, G, P)    | 7. 4590 (C, F)    | 10. 182 (C, E, F, M, P, S)                   |
| 4. 80 (C, F, M, P, T) |                   |  |

\*The form  $1+\sqrt{3}$  is preferred so that there is no question as to whether the "+ 1" is under the radical.

# Warm-Up 15

## Answers

- |                    |           |                       |                    |                  |              |
|--------------------|-----------|-----------------------|--------------------|------------------|--------------|
| 1. 36              | (C, M, T) | 4. $\frac{8}{15}$     | (C, F, M, P, T)    | 7. 27            | (C, G, P, S) |
| 2. 58              | (C, G)    | 5. $(\frac{3}{2}, 2)$ | (C, F, M)          | 8. $\frac{1}{6}$ | (F, M, P, S) |
| 3. $\frac{\pi}{3}$ | (C, F, M) | 6. 4                  | (C, E, F, G, P, T) | 9. 56            | (C, E, S, T) |
|                    |           |                       |                    | 10. 165          | (C, P, S, T) |

# Warm-Up 16

## Answers

- |                       |              |                          |           |                  |              |
|-----------------------|--------------|--------------------------|-----------|------------------|--------------|
| 1. 90                 | (C, F, M)    | 5. $\frac{3\sqrt{3}}{2}$ | (F, M)    | 8. $\frac{4}{5}$ | (C, F)       |
| 2. $\frac{1}{5}$      | (C, G, P, T) | 6. $\frac{4\sqrt{3}}{9}$ | (C, F, M) | 9. 12            | (C, F, M, P) |
| 3. 4                  | (G, P, S, T) | 7. 29                    | (C, F, M) | 10. 201          | (C, F, M, P) |
| 4. $\frac{2040}{409}$ | (C, F, M)    |                          |           |                  |              |

# Workout 8

## Answers

- |               |              |              |              |                    |              |
|---------------|--------------|--------------|--------------|--------------------|--------------|
| 1. 42.3       | (C, F)       | 5. 6,666,600 | (C, P, S, T) | 8. 457             | (C, E, G, T) |
| 2. $4 - \pi$  | (C, F, M, P) | 6. 925       | (C, G, P, S) | 9. $\frac{180}{7}$ | (C, T)       |
| 3. $\sqrt{6}$ | (C, F)       | 7. 3         | (F, G, M)    | 10. 27             | (C, F, T)    |
| 4. 11,519     | (C, F, S)    |              |              |                    |              |

# Warm-Up 17

## Answers

- |               |                 |                    |                 |                 |                 |
|---------------|-----------------|--------------------|-----------------|-----------------|-----------------|
| 1. 360        | (C, F, M, S, T) | 5. $\frac{2}{5}$   | (F, M, T)       | 8. 30           | (C, G, M)       |
| 2. 26         | (C, F, M)       | 6. 55              | (E, G, M, P, T) | 9. 150          | (C, E, P, S, T) |
| 3. (2, 4)     | (C, F, M)       | 7. $16\frac{3}{4}$ | (C, F, M, P, T) | 10. $\sqrt{10}$ | (C, F, M)       |
| 4. $\sqrt{2}$ | (F, M, S)       |                    |                 |                 |                 |

# Warm-Up 18

## Answers

- |   |                                     |                    |
|---|-------------------------------------|--------------------|
| 1. 5:11:4 (C, F, M, P, S)                   | 5. $\frac{6\sqrt{21}}{7}$ (C, F, M) | 8. 30 (E, G, S, T) |
| 2. $3+2\sqrt{2}$ (F, M)<br>or $2\sqrt{2}+3$ | 6. $\frac{1}{2}$ (C, G, M, T)       | 9. 13 (M, T)       |
| 3. 7 (C, F, S)                              | 7. 1728 (P, T)                      | 10. 16 (M, T)      |
| 4. 18 (C, E, F, G, T)                       |                                     |                    |

# Workout 9

## Answers

- |                        |                   |                          |
|------------------------|-------------------|--------------------------|
| 1. 240 (F, M)          | 5. 942,480 (C, G) | 8. $104\pi$ (C, F, G, M) |
| 2. 5.66 (F, M)         | 6. 12 (C, F, M)   | 9. 168 (C, M, T)         |
| 3. 13 (E, G, T)        | 7. 52 (C, F, M)   | 10. 19 (C, M, T)         |
| 4. 1,353,400 (C, F, P) |                   |                          |

# Number Theory Stretch

## Answers

- |  |                          |                             |
|--|--------------------------|-----------------------------|
| 1. $2^3 \times 3^2 \times 7$ or $2^3 \times 3^2 \times 7^1$ (C, M) | 5. 71 (E, G, P, S, T)    | 8. (3, 6) (G, M, T)         |
| 2. 24 (C, F, P, T)   | 6. 58 (C, G, M, P, S, T) | 9. (86, 4, 10) (C, E, G, P) |
| 3. 1560 (C, T)   | 7. 3 (E, G, T)           | 10. 3 (P, S)                |
| 4. 738 (C, F)  |                          |                             |

# Patterns Stretch

## Answers

- |                              |                          |                       |
|------------------------------|--------------------------|-----------------------|
| 1. $\frac{1}{6}$ (P)         | 5. 9900 (C, F, M, P, S)  | 8. Saturday (C, G, P) |
| 2. 257 (M, P)                | 6. 35 (C, F, M, P)       | 9. 156 (C, P, S)      |
| 3. 40 (E, G, P)              | 7. $\frac{1}{13}$ (C, P) | 10. 21 (C, G, P)      |
| 4. $\frac{2}{101}$ (C, F, P) |                          |                       |



