

Column 1

Day 1 Part A 1-20
Day 2 Part B 1-18
Day 3 Part B 19-24
Day 3 Part D 1-3

Answers to odd-numbered problems are given in the Appendix.

A. Reading, Writing, and Rounding Whole Numbers

Write in words.

- | | | |
|------------|--------------|------------|
| 1. 593 | 2. 6710 | 3. 45,206 |
| 4. 137,589 | 5. 2,403,560 | 6. 970,001 |
| 7. 10,020 | 8. 1,528,643 | |

Write as numbers.

- | | |
|--|--|
| 9. Four hundred eight | 10. Six thousand, three hundred twenty-seven |
| 11. Two hundred thirty thousand, fifty-six | 12. Five million, ninety-eight thousand, one hundred seven |
| 13. Sixty-four thousand, seven hundred | 14. Eight hundred fifty-two million |

Round as indicated.

- | | |
|---|---|
| 15. 692 to the nearest ten | 16. 5476 to the nearest hundred |
| 17. 17,528 to the nearest thousand | 18. 94,746 to the nearest hundred |
| 19. 652,738 to the nearest hundred thousand | 20. 705,618 to the nearest ten thousand |

B. Perform the arithmetic as shown.

- | | | |
|----------------------|---------------------------|---------------------------|
| 1. $24 + 69$ | 2. $38 + 45$ | 3. $456 + 72$ |
| 4. $43 + 817$ | 5. $396 + 538$ | 6. $2074 + 906$ |
| 7. $43 - 28$ | 8. $93 - 67$ | 9. $734 - 85$ |
| 10. $315 - 119$ | 11. $543 - 348$ | 12. $3401 - 786$ |
| 13. 376×4 | 14. 489×7 | 15. 67×21 |
| 16. 45×82 | 17. 207×63 | 18. 314×926 |
| 19. 5236×44 | 20. 4018×392 | 21. $259 \div 7$ |
| 22. $1704 \div 8$ | 23. $42 \overline{)2394}$ | 24. $34 \overline{)2108}$ |

D. Practical Applications

- Electrical Trades** From a roll of No. 12 wire, an electrician cut the following lengths: 6, 8, 20, and 9 ft. How many feet of wire did he use?
- Machine Trades** A machine shop bought 14 steel rods of $\frac{7}{8}$ -in.-diameter steel, 23 rods of $\frac{1}{2}$ -in. diameter, 8 rods of $\frac{1}{4}$ -in. diameter, and 19 rods of 1-in. diameter. How many rods were purchased?
- Interior Design** In estimating the floor area of a house, Jean listed the rooms as follows: living room, 346 sq ft; dining room, 210 sq ft; four bedrooms, 164 sq ft each; two bathrooms, 96 sq ft each; kitchen, 208 sq ft; and family room, 280 sq ft. What is the total floor area of the house?
- Allied Health** A patient was instructed to take one tablet of blood pressure medication twice daily (one tablet in the morning and one in the evening). Before the patient leaves for a 12-week summer holiday, the medical technician must determine how many tablets the patient will need over her entire holiday. How many tablets will the patient require?
- Electrical Trades** Roberto has 210 ft of No. 14 wire left on a roll. If he cuts it into pieces 35 ft long, how many pieces will he get?

Column 2

Day 4 Part A 1-20, Part B 1-10
Day 5 Part C 1-14
Day 6 Part E 1-4

Answers to odd-numbered problems are given in the Appendix.

A. Write in words:

- | | | | |
|---------|---------|-----------|-----------|
| 1. 0.91 | 2. 0.84 | 3. 23.164 | 4. 63.219 |
| 5. 9.3 | 6. 3.45 | 7. 10.06 | 8. 15.037 |

Write as decimal numbers.

- Seven hundredths
- Eighteen thousandths
- Two hundred and eight tenths
- Sixteen and seventeen hundredths
- Sixty-three and sixty-three thousandths
- One hundred ten and twenty-one thousandths
- Five and sixty-three ten-thousandths
- Eleven and two hundred eighteen ten-thousandths

B. Add or subtract as shown.

- | | |
|-----------------------|-----------------------|
| 1. $4.39 + 18.8$ | 2. $18.8 + 156.16$ |
| 3. $\$7.52 + \$11.77$ | 4. $26 + 0.06$ |
| 5. $3.68 - 1.74$ | 6. $\$12.46 - \$8.51$ |
| 7. $104.06 - 15.80$ | 8. $16 - 3.45$ |
| 9. $264.3 + 12.804$ | 10. $0.232 + 5.079$ |

C. Calculate as shown.

- | | |
|-----------------------------------|-------------------------------------|
| 1. 0.004×0.02 | 2. 0.06×0.05 |
| 3. 1.4×0.6 | 4. 3.14×12 |
| 5. $0.2 \times 0.6 \times 0.9$ | 6. 5.3×0.4 |
| 7. 6.02×3.3 | 8. $3.224 \div 2.6$ |
| 9. $187.568 \div 3.04$ | 10. $0.078 \div 0.3$ |
| 11. $0.6 \times 3.15 \times 2.04$ | 12. $3.78 + 4.1 \times 6.05$ |
| 13. $0.008 - 0.001 \div 0.5$ | 14. $3.1 \times 4.6 - 2.7 \div 0.3$ |

E. Practical Applications

- Machine Trades** A $\frac{5}{16}$ -in. bolt weighs 0.43 lb. How many bolts are there in a keg containing 125 lb of bolts?
- Metalworking** Twelve equally spaced holes are to be drilled in a metal strip $3\frac{1}{2}$ -in. long, with 2 in. remaining on each end. What is the distance, to the nearest hundredth of an inch, from center to center of two consecutive holes?
- Plumbing** A plumber finds the length of pipe needed to complete a bend by performing the following multiplication:
Length needed = $0.01745 \times (\text{radius of the bend}) \times (\text{angle of bend})$
What length of pipe is needed to complete a 35° bend with a radius of 16 in.?
- Office Services** During the first six months of the year the Busy Bee Printing Co. spent the following amounts on paper:

January	\$1070.16	February	\$790.12	March	\$576.77
April	\$600.09	May	\$1106.45	June	\$589.21

What is the average monthly expenditure for paper?

Column 3
 Day 7 Part A 1-2
 Part B 1-6
 Day 8 Part C 1-10
 Part D 1-12

Column 4
 Day 9 11-17
 Day 10 18-25

Answers to odd-numbered problems are given in the Appendix.

A. Complete the following tables.

1.

	Diameter of Pulley A	Diameter of Pulley B	Pulley Ratio $\frac{A}{B}$
(a)	12 in.		2 to 5
(b)	95 cm	38 cm	
(c)		15 in.	5 to 3

2.

	Teeth on Driven Gear A	Teeth on Driving Gear B	Gear Ratio, $\frac{A}{B}$
(a)	20	60	
(b)		10	6.5
(c)	56		4 to 3

B. Solve the following proportions.

1. $\frac{5}{6} = \frac{x}{42}$ 2. $\frac{8}{15} = \frac{12}{x}$ 3. $\frac{x}{12} = \frac{15}{9}$
 4. $\frac{3\frac{1}{2}}{x} = \frac{5\frac{1}{4}}{18}$ 5. $\frac{1.6}{5.2} = \frac{4.4}{x}$ 6. $\frac{x}{12.4} = \frac{4 \text{ ft } 6 \text{ in.}}{6 \text{ ft } 3 \text{ in.}}$

C. Write each number as a percent.

1. 0.72 2. 0.06 3. 0.6 4. 0.358 5. 1.3
 6. 3.03 7. 4 8. $\frac{7}{10}$ 9. $\frac{1}{8}$ 10. $2\frac{3}{5}$

D. Write each percent as a decimal number.

1. 4% 2. 37% 3. 11% 4. 94%
 5. $1\frac{1}{4}\%$ 6. 0.09% 7. $\frac{1}{5}\%$ 8. 1.7%
 9. $3\frac{7}{8}\%$ 10. 8.02% 11. 115% 12. 210%

E. Write each of the following percents as a fraction in lowest terms.

1. 28% 2. 375% 3. 81% 4. 4%
 5. 0.5% 6. 70% 7. 14% 8. $41\frac{2}{3}\%$

11. Manufacturing A production job is bid at \$6275, but cost overruns amount to 15%. What is the actual job cost?
12. Metalworking When heated, a metal rod expands 3.5%, to 15.23 cm. What is its cold length?
13. Electrical Trades An electrical resistor is rated at 4500 ohms $\pm 3\%$. Express this tolerance in ohms and state the actual range of resistance.
14. Automotive Trades A 140-hp automobile engine delivers only 126 hp to the driving wheels of the car. What is the efficiency of the transmission and drive mechanism?
15. Metalworking A steel casting has a hot length of 26.500 in. After cooling, the length is 26.255 in. What is the shrinkage expressed as a percent? Round to one decimal place.
16. Automotive Trades The parts manager for an automobile dealership can buy a part at a 25% discount off the retail price. If the retail price is \$46.75, how much does he pay?
17. Manufacturing An electric shop motor rated at 2.5 hp is found to deliver 1.8 hp to a vacuum pump when it is connected through a belt drive system. What is the efficiency of the drive system?
18. Trades Management To purchase a truck for his mobile welding service, Jerry arranges a 36-month loan of \$45,000 at 4.75% annual interest.
 (a) What total interest will he pay?
 (b) What monthly payment will he make? (Assume equal monthly payments on interest and principal.)
19. HVAC The motor to run a refrigeration system is rated at 12 hp, and the system has an efficiency of 76%. What is the effective cooling power output of the system?
20. Interior Design An interior designer is able to purchase a sofa from a design center for \$1922. His client would have paid \$2480 for the same sofa at a furniture store. What rate of discount was the designer receiving off the retail price?
21. Life Skills The commission rate paid to a manufacturer's rep varies according to the type of equipment sold. If his monthly statement showed \$124,600 in sales, and his total commission was \$4438, what was his average rate of commission to the nearest tenth of a percent?
22. Masonry Six square feet of a certain kind of brick wall contains 78 bricks. How many bricks are needed for 150 sq ft?
23. Transportation If 60 mph (miles per hour) is equivalent to 88 fps (feet per second), express
 (a) 45 mph in feet per second.
 (b) 22 fps in miles per hour.
24. Automotive Trades The headlights on a car are mounted at the height of 28 in. The light beam must illuminate the road for 400 ft. That is, the beam must hit the ground 400 ft ahead of the car.
 (a) What should be the drop ratio of the light beam in inches per foot?
 (b) What is this ratio in inches per 25 ft?
25. Printing A photograph measuring 8 in. wide by 12 in. long must be reduced to a width of $3\frac{1}{2}$ in. to fit on a printed page. What will be the corresponding length of the reduced photograph?