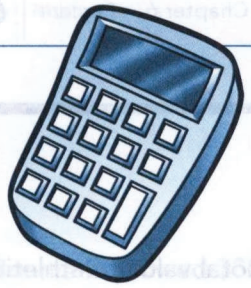


Chapter 7

Measurement

GED Mathematics pp. 183–196
Complete GED pp. 873–892

Basic Skills

Directions: For problems 1–4, fill in each blank with the correct equivalent of each customary unit of measure. Then check and correct your answers before you continue.

1. Measures of Length

1 foot (ft) = _____ inches (in.)
1 yard (yd) = _____ inches
1 yard = _____ feet
1 mile (mi) = _____ feet
1 mile = _____ yards

2. Measures of Weight

1 pound (lb) = _____ ounces (oz)
1 ton (T) = _____ pounds

3. Liquid Measures

1 pint (pt) = _____ ounces
1 cup = _____ ounces
1 pint = _____ cups
1 quart (qt) = _____ pints
1 gallon (gal) = _____ quarts

4. Measures of Time

1 minute (min) = _____ seconds (sec)
1 hour (hr) = _____ minutes
1 day = _____ hours
1 week (wk) = _____ days
1 year (yr) = _____ days

For problems 5–8, change each unit to the larger unit indicated. Express each answer as a fraction in lowest terms.

5. 1200 pounds = _____ ton 6 hours = _____ day

6. 6 inches = _____ foot 12 ounces = _____ pound

7. 45 minutes = _____ hour 1 quart = _____ gallon

8. 21 inches = _____ yard 4 inches = _____ foot

For problems 9–11, change each unit to the smaller unit indicated.

9. 2 pounds = _____ ounces 6 feet = _____ inches

10. 3 minutes = _____ seconds 5 yards = _____ feet

11. 10 tons = _____ pounds 3 days = _____ hours

For problems 12–14, fill in each blank with the correct equivalent of each metric unit of measure. Then check and correct your answers before you continue.

12. Measures of Length

1 meter (m) = _____ millimeters (mm)

1 meter = _____ centimeters (cm)

1 kilometer (km) = _____ meters

1 decimeter (dm) = _____ meter

13. Measures of Weight

1 gram (g) = _____ milligrams (mg)

1 kilogram (kg) = _____ grams

14. Liquid Measures

1 liter (L) = _____ milliliters (mL)

1 deciliter (dL) = _____ liter

For problems 15–18, change each metric measurement to the unit indicated.

15. 3.15 kilograms = _____ grams 2 kilometers = _____ meters

16. 4 meters = _____ centimeters 1.5 liters = _____milliliters

17. 60 centimeters = _____ meter 850 grams = _____ kilogram

18. 250 meters = _____ kilometer 135 milliliters = _____ liter

Solve the following problems.

19. Change 20 ounces to pounds. Express your answer as a decimal (a whole number and a decimal).

20. Change 21 inches to feet. Express your answer as a mixed number (a whole number and a fraction).

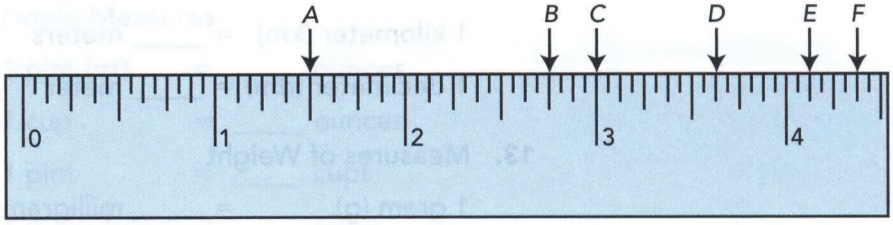
21. Change 2500 pounds to tons and pounds.

22. Change 90 minutes to hours. Express your answer as a decimal.

23. Change 10 quarts to gallons. Express your answer as a mixed number.

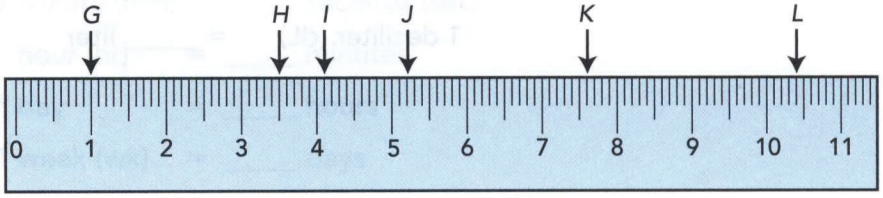
24. Change 5680 feet to miles and feet.

25. For each letter on the $4\frac{1}{2}$-inch ruler below, tell the distance, in inches, from 0.



A = B = C = D = E = F =

26. For each letter on the 11-centimeter ruler below, tell the distance, in centimeters, from 0.



G = H = I = J = K = L =

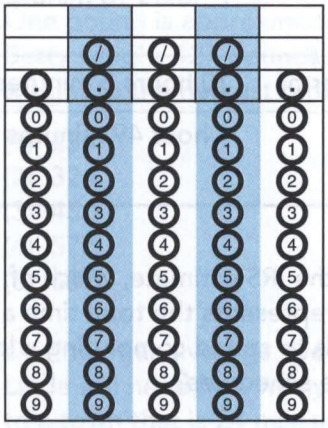
Answers are on page 141.

GED PRACTICE

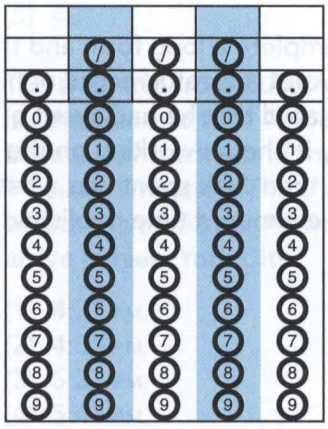
PART I

Directions: You may use a calculator to solve the following problems. For problems 1–3, mark each answer on the corresponding number grid.

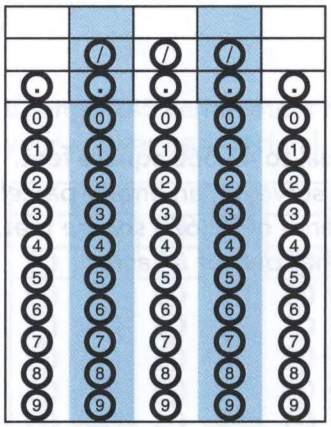
1. Paula used 6 ounces of sugar from a 2-pound bag. What fraction of the sugar in the bag did she use?



2. What is the mean weight of three parcels that weigh 0.6 kilogram, 1.41 kilograms, and 1.8 kilograms?



3. Normal body temperature is 98.6° Fahrenheit. When he had the flu, Mack's temperature reached 103.5°F. How many degrees above normal was his temperature?



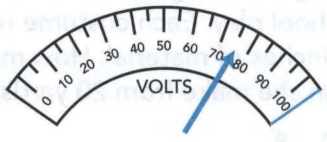
Choose the correct answer to each problem.

4. The formula $C = \frac{5}{9}(F - 32)$ converts Fahrenheit temperature (F) to Celsius temperature (C). What is the Celsius temperature that corresponds to a healthy body temperature of 98.6° Fahrenheit?

(1) 31°
(2) 33°
(3) 35°
(4) 37°
(5) 39°

5. It takes $\frac{1}{10}$ of a second for a voltmeter to rise one volt. Approximately how many seconds will it take the voltmeter to reach the reading shown below?

(1) 75.0
(2) 70.0
(3) 7.5
(4) 0.75
(5) 0.0075



6. At $5.89 a pound, what is the price of a can of coffee that weighs 8 ounces?

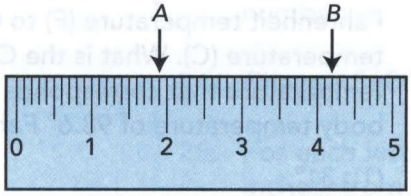
(1) $3.89
(2) $3.11
(3) $2.95
(4) $2.89
(5) $2.68

7. One acre is equal to 43,560 square feet. According to a surveyor, an empty parcel of land has an area of 32,670 square feet. The parcel is what part of an acre?

(1) 0.25
(2) 0.3
(3) 0.5
(4) 0.65
(5) 0.75

8. What is the distance, in centimeters, from point A to point B on the 5-centimeter ruler below?

(1) 1.7
(2) 2.3
(3) 2.7
(4) 3.3
(5) 3.7



9. Roast beef costs $3.69 a pound. Find the cost of 1 pound 12 ounces of roast beef.

(1) $6.46
(2) $5.54
(3) $4.81
(4) $4.43
(5) $3.81

10. Meg is making costumes for her daughter's school play. Each costume requires 2 yards 9 inches of material. How many costumes can she make from 20 yards of material?

(1) 8
(2) 9
(3) 10
(4) 11
(5) 12

Problems 11 and 12 refer to the following information.

The Internal Revenue Service published the following list of the estimated time a taxpayer would spend completing a long form and three accompanying schedules.

Record keeping	7 hours 52 minutes
Learning about the forms	7 hours 16 minutes
Preparing the forms	10 hours 5 minutes
Assembling and sending	1 hour 49 minutes

11. According to the IRS estimate, which of the following represents the total time a taxpayer needs to spend completing a long form and three schedules?

(1) 19 hr 42 min
(2) 21 hr 12 min
(3) 23 hr 32 min
(4) 25 hr 2 min
(5) 27 hr 2 min

12. Jack had to complete a long form and three schedules. He kept a careful record of his time and calculated that he had spent a total of exactly 24 hours working on the tax forms. The time Jack spent was what fraction of the estimated time published by the IRS?

(1) $\frac{9}{10}$
(2) $\frac{8}{9}$
(3) $\frac{7}{8}$
(4) $\frac{5}{6}$
(5) $\frac{3}{4}$

13. How many miles can Bill drive in 2 hours 15 minutes if he maintains an average speed of 64 mph?

(1) 144
(2) 138
(3) 128
(4) 114
(5) 98

14. One pound is approximately 0.453 kilogram. Betty weighs 127 pounds. What is her weight to the nearest tenth of a kilogram?

(1) 25.4
(2) 32.6
(3) 45.3
(4) 57.5
(5) 63.5

15. Driving at an average speed of 45 mph, Linda will need how many minutes to drive to a town that is 24 miles away?

(1) 24
(2) 28
(3) 32
(4) 36
(5) 40

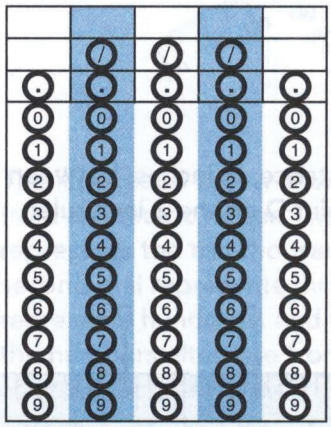
16. The train trip from Buffalo to New York City is scheduled to take 7 hours 28 minutes. Because of track work, the train was late by 1 hour 20 minutes. The train left Buffalo on schedule at 8:55 A.M. At what time did it arrive in New York City?

(1) 4:23 P.M.
(2) 4:53 P.M.
(3) 5:23 P.M.
(4) 5:43 P.M.
(5) 6:03 P.M.

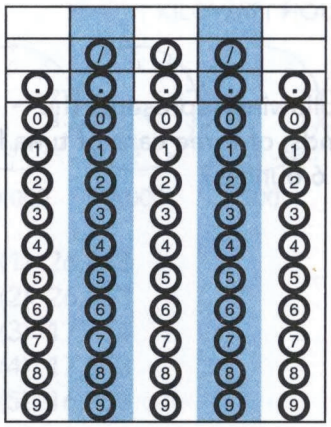
PART II

Directions: Solve the following problems without a calculator. For problems 16 and 17, mark each answer on the corresponding number grid.

17. Change 245 centimeters to meters. Express your answer as a decimal.



18. Ten ounces are what fraction of a pound?



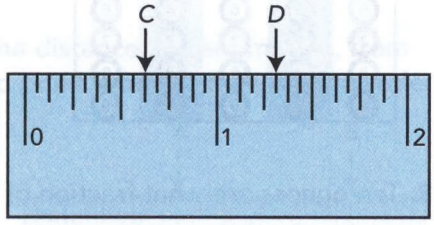
Choose the correct answer to each problem.

19. The formula $F = \frac{9}{5}C + 32$ converts Celsius temperature to Fahrenheit temperature. A temperature of 40° Celsius in Rio de Janeiro corresponds to what Fahrenheit temperature?

(1) 78°
(2) 84°
(3) 94°
(4) 104°
(5) 108°

20. What is the distance, in inches, between point C and point D on the 2-inch ruler below?

(1) $\frac{7}{16}$
(2) $\frac{9}{16}$
(3) $\frac{11}{16}$
(4) $1\frac{3}{16}$
(5) $1\frac{5}{16}$

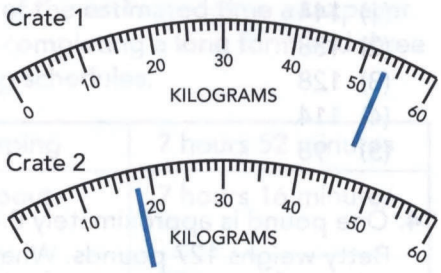


21. Which of the following represents the weight, in pounds, of three cans of tuna fish, each weighing 6 ounces?

(1) $\frac{3 \times 16}{6}$
(2) $\frac{3 \times 6}{16}$
(3) $\frac{6 \times 16}{3}$
(4) $\frac{16}{3 \times 6}$
(5) $\frac{6}{3 \times 16}$

22. The kilogram scales show the weights of two crates. How many kilograms heavier is crate 1 than crate 2?

(1) 25
(2) 28
(3) 35
(4) 38
(5) 42

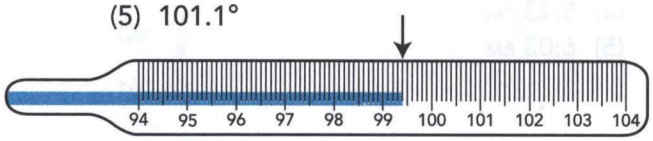


23. Sam has to drive from Jacksonville to Ft. Lauderdale on Highway 1. The distance between the two cities is 324 miles. Sam stopped for a break in West Palm Beach, which is 281 miles from Jacksonville. Approximately what fraction of the total drive had Sam completed when he took the break?

(1) $\frac{1}{2}$
(2) $\frac{2}{3}$
(3) $\frac{3}{4}$
(4) $\frac{7}{8}$
(5) $\frac{9}{10}$

24. What is the reading on the Fahrenheit thermometer pictured below?

(1) 98.9°
(2) 99.4°
(3) 99.9°
(4) 100.1°
(5) 101.1°



25. Carmen drove for 2 hours at 55 mph and then for another $1\frac{1}{2}$ hours at 12 mph. Which expression represents her average speed for the whole trip?

(1) $\frac{55 + 12}{3.5}$

(2) $\frac{55 \times 2 + 12 \times 1.5}{2}$

(3) $\frac{55 \times 2 + 12 \times 1.5}{3.5}$

(4) $\frac{55 \times 3.5 + 12 \times 1.5}{1.5}$

(5) $\frac{12 \times 2 + 55 \times 1.5}{3.5}$

26. What is the reading, in amps, on the meter shown below?

(1) 7
(2) 13
(3) 17
(4) 23
(5) 27

27. The illustration below shows a 1-pint measuring cup. The shaded part represents cooking oil. Which of the following does *not* represent the amount of cooking oil in the measuring cup?

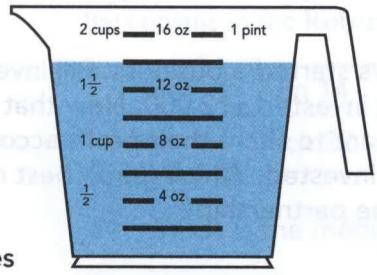
(1) 14 ounces

(2) $1\frac{3}{4}$ cups

(3) $\frac{7}{8}$ pint

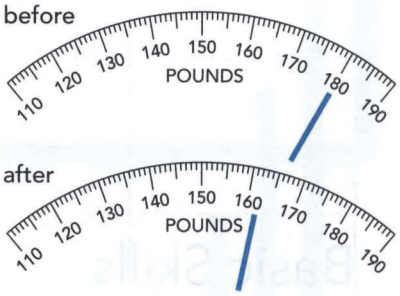
(4) $\frac{1}{2}$ quart

(5) 1 cup 6 ounces



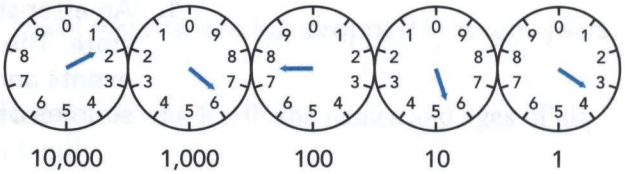
28. The two scales show Mark's weight before and after his diet. What percent of Mark's original weight did he lose?

(1) 5%
(2) 10%
(3) 12.5%
(4) 15%
(5) 20%



29. The illustration below shows five dials from an electric meter. The leftmost dial represents the ten-thousands place. The second dial represents thousands. The third represents hundreds, and so on. Notice that the numbers alternate from clockwise to counterclockwise. When an arrow appears between two numbers, read the lower number. What is the kilowatt-hour reading of the dials?

KILOWATT HOURS



(1) 26,853
(2) 26,753
(3) 17,754
(4) 17,853
(5) 16,753

Answers are on page 142.

18. (3) 176
$20\% = 0.2$
$0.2 \times 220 = 44$
$220 - 44 = 176$

19. (4) $1.06 \times \$139$
The price is 100%.
The tax is 6%.
$100\% + 6\% = 106\% = 1.06$
The price is $1.06 \times \$139$.

20. (5) $\frac{48}{100}$
The other answers all equal $\frac{480}{800}$ or $\frac{3}{5}$.

21. (1) $\frac{\$2700 \times 0.18}{12}$
$18\% = 0.18$
$\$2700 \times 0.18$ for 1 year
Divide by 12 for one month.

22. (3) $0.9 \times \$16.95$
Original price is 100%.
Sale price is $100\% - 10\% = 90\% = 0.9$
The price is $0.9 \times \$16.95$.

23. (3) 50 times faster
To change 5000% to a whole number, move the decimal point 2 places to the left.

24. (2) $\frac{115 - 60}{60}$
The change is $115 - 60$.
The original membership is 60.

25. (5) 37,500
$150\% = 1.5$
$1.5 \times 15{,}000 = 22{,}500$
$15{,}000 + 22{,}500 = 37{,}500$

26. (4) \$32
$60\% = 0.6$
$0.6 \times \$80 = \$48$
$\$80 - \$48 = \$32$

27. (1) 700%
$\$200{,}000 - \$25{,}000 = \$175{,}000$
$\frac{\text{change}}{\text{original}} = \frac{\$175{,}000}{\$25{,}000} = \frac{7}{1} = 700\%$

28. (2) $\$3000 \times 0.065 \times \frac{2}{3}$
$6.5\% = 0.065$ and 8 months $= \frac{8}{12} = \frac{2}{3}$ year
$i = prt = \$3000 \times 0.065 \times \frac{2}{3}$

29. (4) \$2 billion
$13\% = 0.13$
$0.13 \times \$15$ billion $=$
$\$1.95 \rightarrow \$2$ billion

30. (3) 50,000
$492{,}385 \rightarrow 500{,}000$ and $10\% = 0.1$
$0.1 \times 500{,}000 = 50{,}000$

Chapter 7

Basic Skills, page 62

1. 1 foot (ft) = 12 inches (in.)
1 yard (yd) = 36 inches
1 yard = 3 feet
1 mile (mi) = 5280 feet
1 mile = 1760 yards

2. 1 pound (lb) = 16 ounces (oz)
1 ton (T) = 2000 pounds

3. 1 pint (pt) = 16 ounces
1 cup = 8 ounces
1 pint = 2 cups
1 quart (qt) = 2 pints
1 gallon (gal) = 4 quarts

4. 1 minute (min) = 60 seconds (sec)
1 hour (hr) = 60 minutes
1 day = 24 hours
1 week (wk) = 7 days
1 year (yr) = 365 days

5. $\frac{1200}{2000} = \frac{3}{5}$ ton $\frac{6}{24} = \frac{1}{4}$ day

6. $\frac{6}{12} = \frac{1}{2}$ foot $\frac{12}{16} = \frac{3}{4}$ pound

7. $\frac{45}{60} = \frac{3}{4}$ hour $\frac{1}{4}$ gallon

8. $\frac{21}{36} = \frac{7}{12}$ yard $\frac{4}{12} = \frac{1}{3}$ foot

9. $2 \times 16 = 32$ ounces $6 \times 12 = 72$ inches

10. $3 \times 60 = 180$ seconds $5 \times 3 = 15$ feet

11. $10 \times 2000 = 20{,}000$ pounds $3 \times 24 = 72$ hours

12. 1 meter (m) = 1000 millimeters (mm)
1 meter = 100 centimeters (cm)
1 kilometer = 1000 meters
1 decimeter (dm) = $\frac{1}{10}$ or 0.1 meter

13. 1 gram (g) = 1000 milligrams (mg)
1 kilogram (kg) = 1000 grams

14. 1 liter (L) = 1000 milliliters (mL)
1 deciliter (dL) = $\frac{1}{10}$ or 0.1 liter

15. $3.15 \times 1000 = 3150$ grams
$2 \times 1000 = 2000$ meters

16. $4 \times 100 = 400$ centimeters
$1.5 \times 1000 = 1500$ milliliters

17. $60 \div 100 = 0.6$ meter
$850 \div 1000 = 0.850$ kilogram

18. $250 \div 1000 = 0.25$ kilometer
$135 \div 1000 = 0.135$ liter

19. $\frac{20}{16} = 1.25$ pounds

20. $\frac{21}{12} = 1\frac{9}{12} = 1\frac{3}{4}$ feet

21. $\frac{2500}{2000} = 1$ ton 500 pounds

22. $\frac{90}{60} = 1.5$ hours

23. $\frac{10}{4} = 2\frac{2}{4} = 2\frac{1}{2}$ gallons

24. $\frac{5680}{5280} = 1$ mile 400 feet

25. A = $1\frac{1}{2}$ in. B = $2\frac{3}{4}$ in. C = 3 in. D = $3\frac{5}{8}$ in.
E = $4\frac{1}{8}$ in. F = $4\frac{3}{8}$ in.

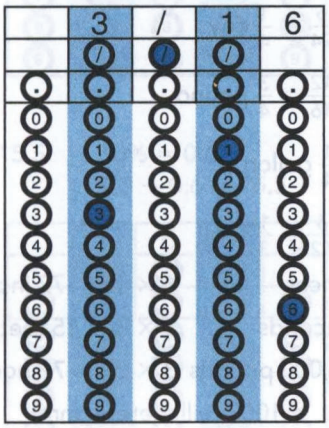
26. G = 1 cm H = 3.5 cm I = 4.1 cm
J = 5.2 cm K = 7.6 cm L = 10.4 cm

GED Practice, Part I, page 65

1. $\frac{3}{16}$

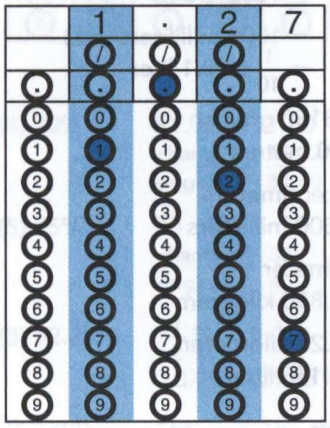
2 lb = 2 × 16 = 32 oz

$\frac{6}{32} = \frac{3}{16}$



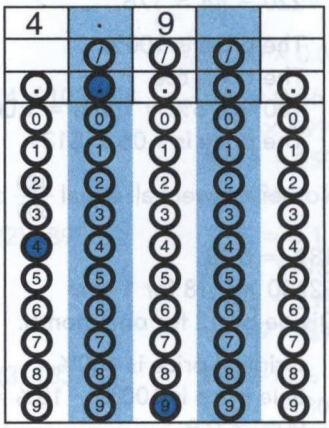
2. 1.27 kg

$\frac{0.6 + 1.41 + 1.8}{3} = \frac{3.81}{3} = 1.27$ kg



3. 4.9°

103.5° − 98.6° = 4.9°



4. (4) 37°

$C = \frac{5}{9}(F - 32)$

$C = \frac{5}{9}(98.6 - 32)$

$C = \frac{5}{9}(66.6)$

$C = 37$

5. (3) 7.5

reading is ≈ 75 volts

$\frac{1}{10} \times 75 = 7.5$

6. (3) $2.95

8 oz = $\frac{8}{16}$ = 0.5 lb

0.5 × $5.89 = $2.945 → $2.95

7. (5) 0.75

$\frac{32,670}{43,560} = 0.75$ acre

8. (2) 2.3

4.2 – 1.9 = 2.3 cm

9. (1) $6.46

1 lb 12 oz = $1\frac{12}{16}$ = 1.75 lb

1.75 × $3.69 = $6.4575 → $6.46

10. (1) 8

2 yd 9 in. = $2\frac{9}{36}$ = 2.25 yd

20 ÷ 2.25 = 8 + remainder

11. (5) 27 hr 2 min

7 hr 52 min
7 hr 16 min
10 hr 5 min
+1 hr 49 min
25 hr 122 min = 27 hr 2 min

12. (2) $\frac{8}{9}$

$\frac{24}{27} = \frac{8}{9}$

13. (1) 144

2 hr 15 min $= 2\frac{15}{60} = 2.25$ hr

d = rt = 64 × 2.25 = 144 miles

14. (4) 57.5

0.453 × 127 = 57.531 → 57.5 kg

15. (3) 32

$\frac{\text{miles}}{\text{minutes}}$ $\frac{45}{60} = \frac{24}{x}$

$45x = 1440$

$x = 32$

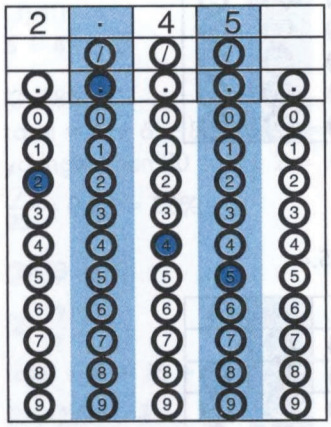
16. (4) 5:43 P.M.

departure	=	8	:	55	
regular travel time	=	7	hr	28	min
additional lateness	=	1	hr	20	min
total	=	16	hr	103	min = 17:43 = 5:43 P.M.

GED Practice, Part II, page 67

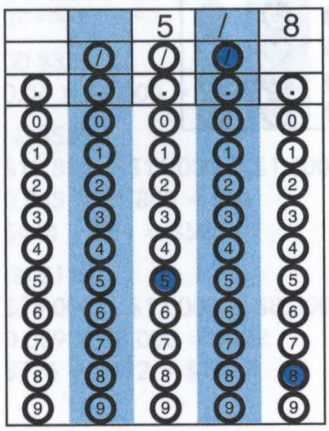
17. 2.45

$\frac{245}{1000} = 2.45$



18. $\frac{5}{8}$

$\frac{10}{16} = \frac{5}{8}$



19. (4) 104°

$F = \frac{9}{5}C + 32$

$F = \frac{9}{5}(40) + 32$

$F = 72 + 32 = 104°$

20. (3) $\frac{11}{16}$

$1\frac{5}{16} = \frac{5}{16} + \frac{16}{16} = \frac{21}{16}$

$-\frac{5}{8} = \frac{10}{16}$

$\frac{11}{16}$ in.

21. (2) $\frac{3 \times 6}{16}$

$\frac{\text{3 cans} \times \text{6 oz each}}{\text{16 oz per pound}}$

22. (3) 35

crate 1 = 53 kg and crate 2 = 18 kg

53 − 18 = 35 kg

23. (4) $\frac{7}{8}$

281 → 280 and 324 → 320

$\frac{280}{320} = \frac{7}{8}$

24. (2) 99.4°

25. (3) $\frac{55 \times 2 + 12 \times 1.5}{3.5}$

$d = rt + rt$

$d = 55 \times 2 + 12 \times 1.5$

$\text{average} = \frac{\text{distance}}{\text{total time}}$

$\text{average} = \frac{55 \times 2 + 12 \times 1.5}{3.5}$

26. (3) 17

27. (4) $\frac{1}{2}$ quart

The other measurements are equal.

In fact, $\frac{7}{16}$ quart is shaded.

28. (2) 10%

before = 180 and after = 162

180 − 162 = 18

$\frac{18}{180} = \frac{1}{10} = 10\%$

29. (5) 16,753

1st dial	10,000
2nd dial	6,000
3rd dial	700
4th dial	50
5th dial	3
	16,753