Grades 6–8 FCAT Mathematics Reference Sheet

### Area

Rectangle $\quad\quad\quad A = bh$

Parallelogram $\quad\quad A = bh$

Triangle $\quad\quad\quad A = \frac{1}{2}bh$

Trapezoid $\quad\quad\; A = \frac{1}{2}h(b_1 + b_2)$

Circle $\quad\quad\quad\; A = \pi r^2$

KEY	
b = base	A = area
h = height	B = area of base
w = width	C = circumference
d = diameter	V = volume
r = radius	P = perimeter of base
ℓ = slant height	$S.A.$ = surface area

Use 3.14 or $\frac{22}{7}$ for π.

Circumference

$$C = \pi d \quad \text{or} \quad C = 2\pi r$$

Volume/Capacity

Total Surface Area

	Volume/Capacity	Total Surface Area
Rectangular Prism	$V = bwh$ or $V = Bh$	$S.A. = 2bh + 2bw + 2hw$ or $S.A. = Ph + 2B$
Right Circular Cylinder	$V = \pi r^2 h$ or $V = Bh$	$S.A. = 2\pi rh + 2\pi r^2$ or $S.A. = 2\pi rh + 2B$
Right Square Pyramid	$V = \frac{1}{3}Bh$	$S.A. = \frac{1}{2}P\ell + B$
Right Circular Cone	$V = \frac{1}{3}\pi r^2 h$ or $V = \frac{1}{3}Bh$	$S.A. = \frac{1}{2}(2\pi r)\ell + B$

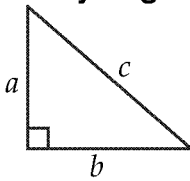Sum of the measures of the interior angles of a polygon = $180(n - 2)$

Measure of an interior angle of a regular polygon $\quad = \dfrac{180(n - 2)}{n}$

where:

$\quad\quad n$ represents the number of sides

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Pythagorean theorem

$$a^2 + b^2 = c^2$$

Simple interest formula

$$I = prt$$

where p = principal, r = rate, t = time

Slope-intercept form of a linear equation

$$y = mx + b$$

where m = slope and b = y-intercept

Distance, rate, time formula

$$d = rt$$

where d = distance, r = rate, t = time

Conversions within a System of Measure

1 yard = 3 feet
1 mile = 1,760 yards = 5,280 feet
1 acre = 43,560 square feet

1 cup = 8 fluid ounces
1 pint = 2 cups
1 quart = 2 pints
1 gallon = 4 quarts
1 pound = 16 ounces
1 ton = 2,000 pounds

1 meter = 100 centimeters = 1000 millimeters
1 kilometer = 1000 meters

1 liter = 1000 milliliters = 1000 cubic centimeters
1 gram = 1000 milligrams
1 kilogram = 1000 grams

1 minute = 60 seconds
1 hour = 60 minutes
1 year = 52 weeks = 365 days

Conversions between Systems of Measure

When converting from Customary to Metric, use these approximations.

1 inch = 2.54 centimeters
1 foot = 0.305 meter
1 mile = 1.61 kilometers

1 cup = 0.24 liter
1 gallon = 3.785 liters
1 ounce = 28.35 grams
1 pound = 0.454 kilogram

When converting from Metric to Customary, use these approximations.

1 centimeter = 0.39 inch
1 meter = 3.28 feet
1 kilometer = 0.62 mile

1 liter = 4.23 cups
1 liter = 0.264 gallon
1 gram = 0.0352 ounce
1 kilogram = 2.204 pounds

Temperature conversions between Celsius and Fahrenheit

$$°C = (°F - 32) \div 1.8$$
$$°F = (°C \times 1.8) + 32$$

Benchmark Test : Grade 7 Math

Name _____ **Date** _____

Class/Grade _____

1 **Benchmark: MA.7.A.1.1**

Michael makes lemonade using a ratio of 10 cups of water to 1 cup of lemon juice. Which equation could be used to find *c*, the number of cups of lemon juice that Michael should use with 15 cups of water?

Ⓐ $\dfrac{10}{1} = \dfrac{15}{c}$

Ⓑ $\dfrac{10}{15} = c$

Ⓒ $\dfrac{10}{1} = \dfrac{c}{15}$

Ⓓ $10 + 1 = 15 + c$

2 **Benchmark: MA.7.A.1.1**

Tisha can type 55 words per minute. At this rate, how many minutes will it take Tisha to type a 5-page report with 275 words per page?

Benchmark Test : Grade 7 Math

3 **Benchmark: MA.7.A.1.1**

Gustavo bought a dozen eggs for $2.38. Which proportion can be used to determine the price, *p*, of each egg in dollars?

(A) $\dfrac{12}{2.38} = \dfrac{12}{p}$

(B) $\dfrac{1}{12} = \dfrac{2.38}{p}$

(C) $\dfrac{12}{2.38} = \dfrac{1}{p}$

(D) $\dfrac{2.38}{12} = \dfrac{1}{p}$

4 **Benchmark: MA.7.A.1.1**

Mike mixes paint at a hardware store. A certain shade of orange paint is made by mixing white, red, and yellow paint in a ratio of 4 to 3 to 2. If Mike wants to make 3 gallons of paint that is this shade of orange, how many gallons of red paint will he need?

(F) $\dfrac{1}{3}$

(G) $\dfrac{2}{3}$

(H) 1

(I) $1\dfrac{1}{3}$

5 **Benchmark: MA.7.A.1.1**

The post office received 219 postcards in 3 weeks. At the same rate, how many postcards will be received in 8 weeks?

(A) 584

(B) 657

(C) 1,752

(D) 5,256

6 **Benchmark: MA.7.A.1.1**

Peter did 4 math problems in 10 minutes. At this rate, how many math problems can Peter do in $1\frac{1}{2}$ hours?

7 **Benchmark: MA.7.A.1.1**

Jan is baking cookies. The recipe calls for $1\frac{1}{4}$ cups of sugar for 2 dozen cookies. Jan wants to make 6 dozen cookies. How many cups of sugar does she need?

Ⓐ $1\frac{1}{12}$ cups

Ⓑ $1\frac{3}{4}$ cups

Ⓒ $2\frac{1}{2}$ cups

Ⓓ $3\frac{3}{4}$ cups

Benchmark Test : Grade 7 Math

8 **Benchmark: MA.7.A.1.1**

The amount of nitrogen in the atmosphere is in a ratio of $\frac{26}{7}$ to the amount of oxygen in the atmosphere. If nitrogen makes up 78% of the atmosphere, what percent of the atmosphere is oxygen?

- Ⓕ 16%
- Ⓖ 19%
- Ⓗ 21%
- Ⓘ 22%

9 **Benchmark: MA.7.A.1.1**

George can bench press $\frac{7}{10}$ the weight that Drew can bench press. If George can bench press 126 pounds, how many pounds can Drew bench press?

- Ⓐ 144
- Ⓑ 150
- Ⓒ 160
- Ⓓ 180

10 **Benchmark: MA.7.A.1.1**

Over the course of 2 hours, Abe assembled 18 plastic toys. If Abe continues assembling toys at this rate, which proportion can be used to determine how many toys, *n*, Abe would assemble in 7 hours?

- Ⓕ $\frac{18}{7} = \frac{2}{n}$
- Ⓖ $\frac{2}{18} = \frac{n}{7}$
- Ⓗ $\frac{2}{7} = \frac{18}{n}$
- Ⓘ $\frac{7}{18} = \frac{2}{n}$

11 **Benchmark: MA.7.A.1.1**

For every 20 gallons of water in a swimming pool, 1 gallon of pool chemicals must be added to keep the pool clean. How many gallons of pool chemicals should be added to 1,040 gallons of water in a swimming pool?

Ⓐ 38

Ⓑ 52

Ⓒ 65

Ⓓ 80

12 **Benchmark: MA.7.A.1.1**

Margaret's receipt from the grocery store is shown below.

```
┌─────────────────────────────────┐
│        CORNER STORE GROCERY      │
│                                  │
│   ───────────────────────────    │
│                                  │
│   BANANAS (40 oz.)        5.00    │
│   GRAPES (12 oz.)         3.20    │
│   MILK (1 gal.)           4.20    │
│   ───────────────────────────    │
│      TOTAL               12.40    │
│      CASH TENDERED       15.00    │
│   ───────────────────────────    │
│      CHANGE DUE           2.60    │
│                                  │
│     THANK YOU FOR SHOPPING       │
│      CORNER STORE GROCERY        │
│                                  │
│   4:35 PM            7/02/06      │
└─────────────────────────────────┘
```

Robert bought 12 ounces of bananas from the same store as Margaret. How much did Robert pay?

Ⓕ $0.96

Ⓖ $1.25

Ⓗ $1.50

Ⓘ $2.20

13 **Benchmark: MA.7.A.1.1**

The ratio of Winona's height to Penelope's height is 19 to 20. If Winona is 57 inches tall, how tall is Penelope?

Ⓐ   60 inches

Ⓑ   63 inches

Ⓒ   65 inches

Ⓓ   66 inches

14 **Benchmark: MA.7.A.1.1**

The local bakery sold 135 dinner rolls during a 5-day period. At the same rate, how many dinner rolls will be sold in 14 days?

Ⓕ   154

Ⓖ   378

Ⓗ   1,890

Ⓘ   9,450

15 **Benchmark: MA.7.A.1.1**

A landscaping crew can mulch 3 flower gardens in $1\frac{1}{2}$ hours. At this rate, how long will it take the crew to mulch 12 flower gardens?

Ⓐ   4 hours

Ⓑ $4\frac{1}{2}$ hours

Ⓒ   6 hours

Ⓓ   18 hours

16 **Benchmark: MA.7.A.1.1**

There are 4 girls for every boy in Andrew's school. There are 164 girls in his school. How many total students are in Andrew's school?

17 **Benchmark: MA.7.A.1.1**

The deli surveyed its customers and found that 5 out of 8 people prefer their sandwiches on a roll rather than on sliced bread. If the deli serves 440 sandwiches in a day, **about** how many should they expect to serve on rolls?

(A)   55

(B)   88

(C) 245

(D) 275

18 **Benchmark: MA.7.A.1.1**

The Keller family drinks 3 gallons of tea every 9 days. At this rate, how many gallons of tea will they drink during their 75-day summer vacation?

19 **Benchmark: MA.7.A.1.1**

Brett sealed 800 envelopes in 20 minutes. Working at the same rate, how many envelopes can he seal in 30 minutes?

Benchmark Test : Grade 7 Math

20 **Benchmark: MA.7.A.1.1**

A newspaper printer can print 15,000 newspapers in 4 hours. At the same rate, how many newspapers can they print in 24 hours?

(F) 3,750

(G) 75,000

(H) 90,000

(I) 360,000

21 **Benchmark: MA.7.A.1.1**

Peggy ran 5 miles in 45 minutes. Which proportion can be used to determine how many minutes, *t*, it would take Peggy to run 1 mile at this rate?

(A) $\dfrac{5}{45} = \dfrac{1}{t}$

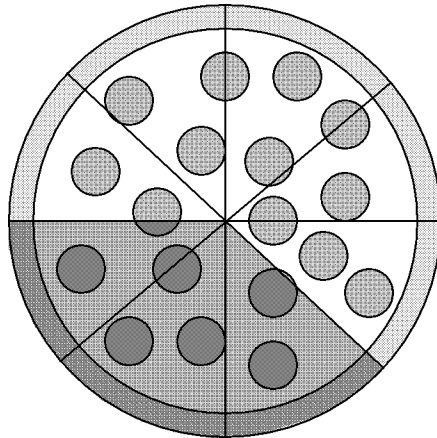(B) $\dfrac{45}{5} = \dfrac{1}{t}$

(C) $\dfrac{5t}{1} = \dfrac{1}{45}$

(D) $\dfrac{5}{1} = \dfrac{t}{45}$

22 **Benchmark: MA.7.A.1.1**

Jared baked a frozen pizza. He cut the pizza into 8 slices of equal size, and then ate 3 of the pieces for lunch. After reading the nutritional information for the pizza, he calculated that his 3 slices contained 438 milligrams of cholesterol.

How many milligrams of cholesterol are in the entire pizza?

Benchmark Test : Grade 7 Math

23 **Benchmark: MA.7.A.1.1**

Gretchen made 240 cookies in 4 hours. At this rate, how many cookies could she make in 9 hours?

24 **Benchmark: MA.7.A.1.1**

The ingredients list for a homemade lemonade recipe is shown below.

Ingredients:
5 lemons
1 cup of brown sugar
3.5 cups of boiling water

Michael wants to use this recipe, but he only has 3 lemons. How many cups of boiling water should he use with only 3 lemons?

Ⓕ 1.7 cups

Ⓖ 2.1 cups

Ⓗ 2.6 cups

Ⓘ 3.1 cups

Go On ▶

Benchmark Test : Grade 7 Math

25 **Benchmark: MA.7.A.1.1**

The ratio of Kirk's weight to his father's weight is 1 to 4. If Kirk's father weighs 168 pounds, how many pounds does Kirk weigh?

(A) 38

(B) 42

(C) 47

(D) 52

26 **Benchmark: MA.7.A.1.1**

Claire is buying bananas. Bananas cost 75 cents a pound, and 4 bananas weigh about one pound. **About** how many bananas can Claire buy for $2.25?

(F) 3

(G) 4

(H) 9

(I) 12

27 **Benchmark: MA.7.A.1.1**

Charity mowed the front yard of her house in 20 minutes. The area of the front yard is 3,000 sq. ft. She is going to mow the backyard also. If the area of the backyard is 2,400 sq. ft., which proportion can be used to determine how many minutes, t, it will take Charity to mow the backyard?

(A) $\dfrac{20}{3,000} = \dfrac{24}{t}$

(B) $\dfrac{3,000}{2,400} = \dfrac{20}{t}$

(C) $\dfrac{20}{t} = \dfrac{2,400}{3,000}$

(D) $\dfrac{20}{3,000} = \dfrac{2,400}{t}$

28 **Benchmark: MA.7.A.1.1**

A music producer is editing a portion of a newly recorded song. The portion of the song that she is editing is currently 48 seconds long and features one sampled recording repeated eight times. She wants to remove two repetitions of the sample to shorten this portion of the song.

Original portion of song
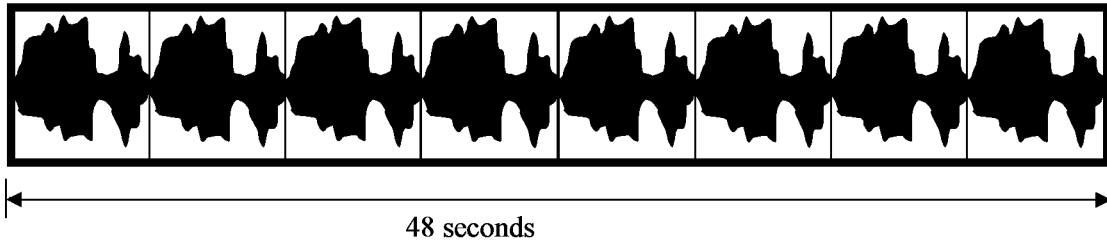
48 seconds

Shortened portion of song

?
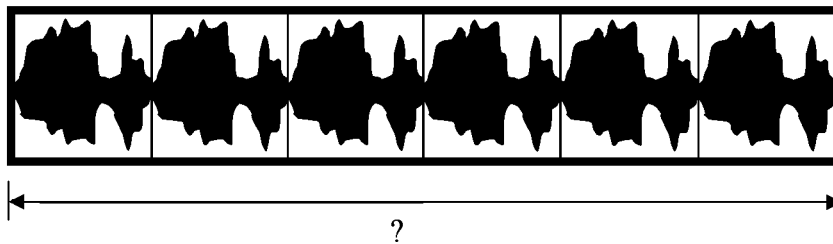
How long will the portion of the song be after it is shortened?

Ⓕ 20 seconds

Ⓖ 24 seconds

Ⓗ 30 seconds

Ⓘ 36 seconds

29 **Benchmark: MA.7.A.1.1**

Vickie sold 342 movie tickets during a 6-hour shift on Friday. If she sells tickets at the same rate on Saturday during an 8-hour shift, how many tickets will she sell?