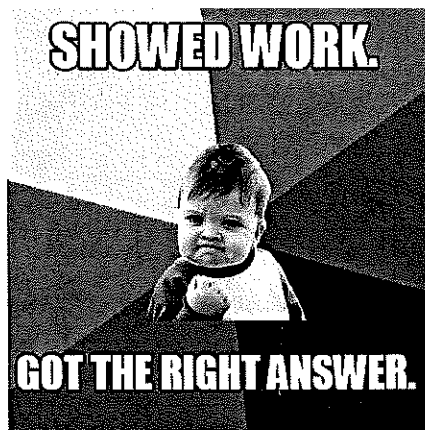
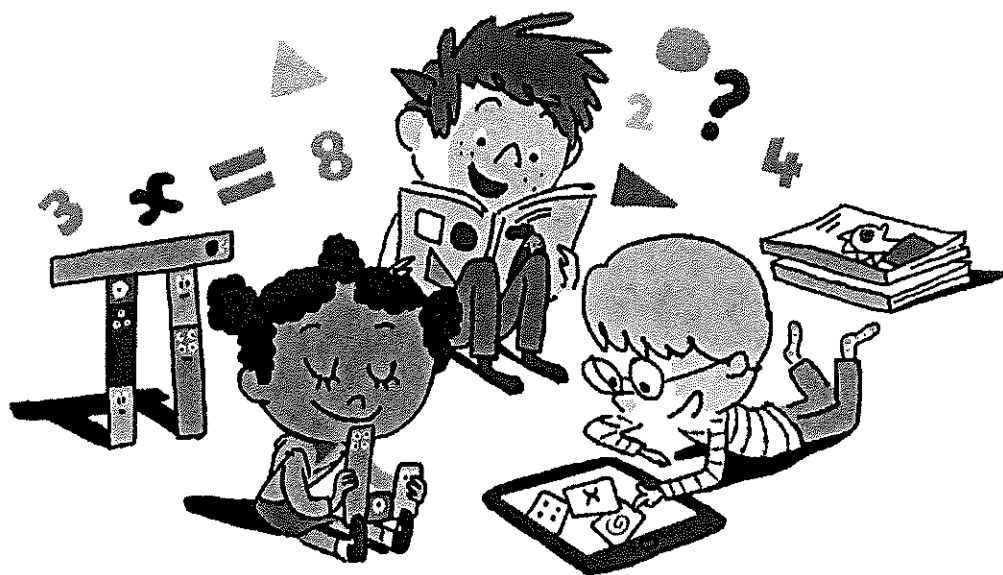
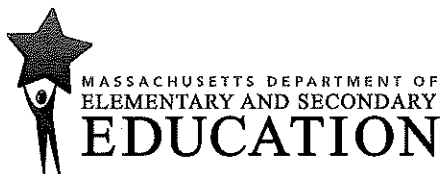


Math Packet





Massachusetts Comprehensive Assessment System Grade 7 Mathematics Reference Sheet

CONVERSIONS

1 cup = 8 fluid ounces

1 pint = 2 cups

1 quart = 2 pints

1 gallon = 4 quarts

1 gallon \approx 3.785 liters

1 liter \approx 0.264 gallon

1 liter = 1000 cubic centimeters

1 inch = 2.54 centimeters

1 meter \approx 39.37 inches

1 mile = 5280 feet

1 mile = 1760 yards

1 mile \approx 1.609 kilometers

1 kilometer \approx 0.62 mile

1 pound = 16 ounces

1 pound \approx 0.454 kilogram

1 kilogram \approx 2.2 pounds

1 ton = 2000 pounds

AREA (A) FORMULAS

square $A = s^2$

rectangle $A = bh$

OR

$$A = lw$$

parallelogram . . $A = bh$

triangle $A = \frac{1}{2}bh$

trapezoid $A = \frac{1}{2}h(b_1 + b_2)$

circle $A = \pi r^2$

VOLUME (V) FORMULAS

cube $V = s^3$

(s = length of an edge)

right prism $V = Bh$

TOTAL SURFACE AREA (SA) FORMULAS

right rectangular prism . . $SA = 2(lw) + 2(hw) + 2(lh)$

CIRCLE FORMULAS

area $A = \pi r^2$

circumference . . $C = 2\pi r$

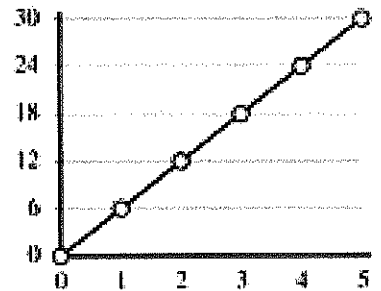
OR

$$C = \pi d$$

Show all your work on a separate piece of paper

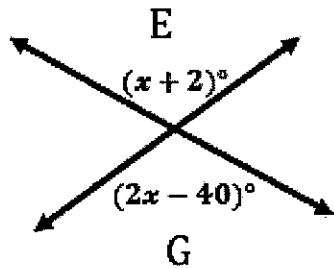
1. At noon the temperature was 2°C . Over the next three hours the temperature dropped another 13 degrees. Then every hour until 7:00 the temperature rose 2 degrees. What was the temperature at 7:00?

2. What is the constant of proportionality in the graph below?



3. Write and solve an equation to find x then find the measure of the unknown angles. Show all of your calculations

a.)

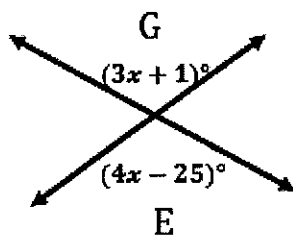


$x =$ _____

$\angle E =$ _____

$\angle G =$ _____

b.)



$x =$ _____

$\angle E =$ _____

$\angle G =$ _____

4. Write down the following FORMULAS for...(some might have more than one)

Area of a Circle: _____

Circumference of a Circle: _____

Diameter of a circle given the radius: _____

Diameter of a circle given the circumference: _____

Radius of a circle given the diameter: _____

5. Using the information below determine the (A) circumference and (B) the area.

Show all of your work in organized calculations. *Round of the nearest hundredth*

<p>Diameter of 12 inches</p> <p>(A) Circumference = _____</p> <p>(B) Area = _____</p> <p>(C) Radius = _____</p>	<p>Radius of $\frac{3}{4}$ cm</p> <p>(A) Diameter: _____</p> <p>(B) Area: _____</p> <p>(C) Circumference: _____</p>
<p>Circumference of 80 feet</p> <p>(A) Area: _____</p> <p>(B) Diameter: _____</p> <p>(C) Radius: _____</p>	<p>Area of 28.26 kg</p> <p>(A) Radius: _____</p> <p>(B) Circumference: _____</p> <p>(C) Diameter: _____</p>

6. Using the information below determine the (A) circumference and (B) the area. Show all of your work in organized calculations.

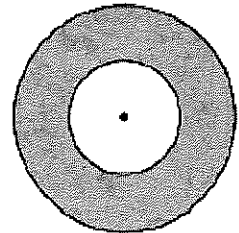
Radius of 5 feet

(A) Circumference =

(B) Area =

7. An amusement park has a diameter of 1550 feet and has a circular walking path around the entire park. The maintenance worker has to walk around the park four times a day. How far does he walk a day? Show your work.

8. The radius of the small circle is 4cm and the area of the large circle is 67.12 square centimeters. Calculate the area of the shaded region.



9. Two angles are complementary. One angle is 49° . What is the measure of the other angle? Show your work with an equation.
10. Three angles are supplementary. One angle is 50° , the other two angles are congruent. What's the measurement of the missing angles?
11. A printer cartridge with $2\frac{2}{3}$ milliliters of ink will print off $3\frac{1}{2}$ reams of paper. How many milliliters of ink will it take to print 5 reams?

12.) A bag with $2\frac{3}{4}$ quarts of peanuts can make $3\frac{3}{4}$ jars of peanut butter. How many quarts of peanuts would you need to make 6 jars? Find the value of A and B in the angles below.

13.)

a = _____

b = _____

Find the measurement of angle XQM and angle MOR.

14.,

a = _____

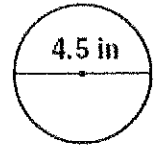
b = _____

Find the measurement of angle XQM and angle MQR.

15. Elena tried to find the circumference of the circle.

What mistake did she make?

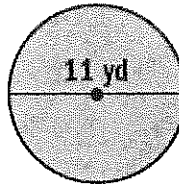
~~$$C = 2 \cdot \pi \cdot \text{radius}$$
$$\approx 2(3.14)(4.5)$$
$$= 28.26 \text{ Inches}$$~~



Find the correct circumference.

b.) Jorge tried to find the area of the circle.

What mistake did Jorge make?

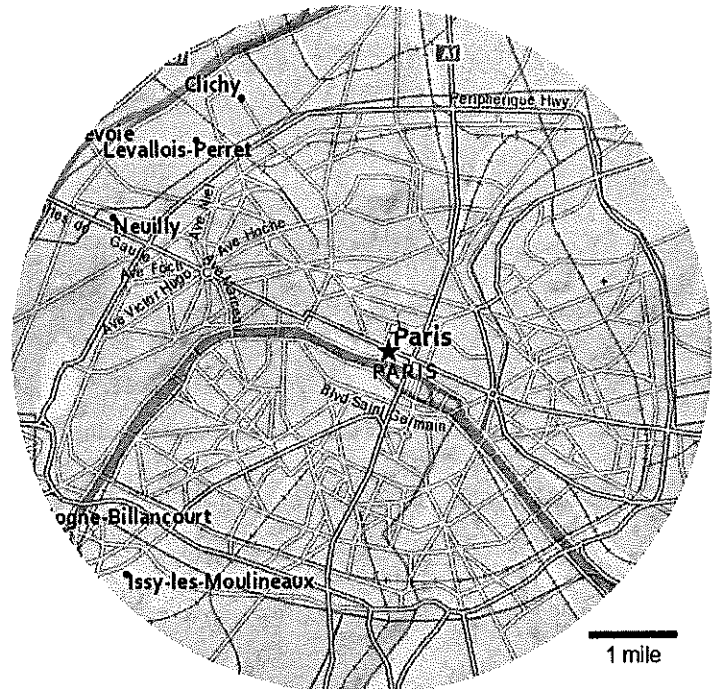


~~$$A = \pi r^2$$
$$\approx (3.14)(11)^2$$
$$= 379.94 \text{ yd}^2$$~~

Find the correct area.

16. The city of Paris, France is completely contained within an almost circular road that goes around the edge. Use the map with its scale to:

a.) Estimate the circumference of Paris.



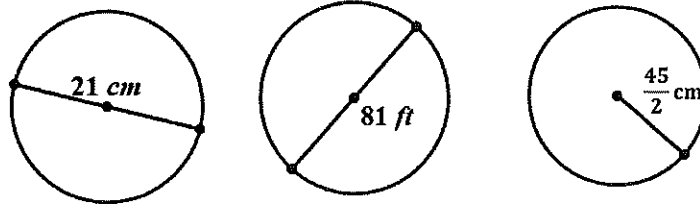
b.) Estimate the area of Paris.

17. The circumference of a circle is 9π cm.

a. What is the diameter?

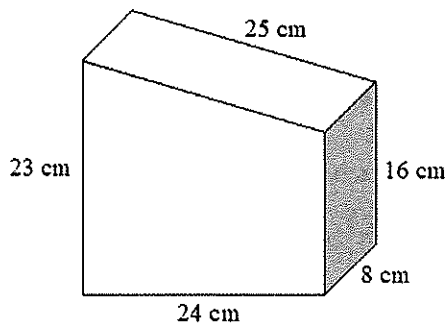
b. What is the area?

18. The following circles are not drawn to scale. Find the area of each circle. (Use $\frac{22}{7}$ or 3.14 as an approximation for π .)



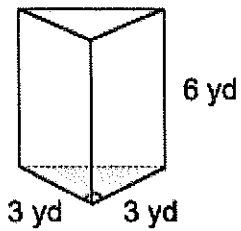
19. During their last workout, Izzy ran $2\frac{1}{4}$ miles in 15 minutes, and her friend Julia ran $3\frac{3}{4}$ miles in 25 minutes. Each girl thought she was the faster runner. Based on their last run, which girl is correct: Izzy, Julia, Both, Neither? Show your work.

20. Explain how to find the surface area of the following figure. Then calculate it.

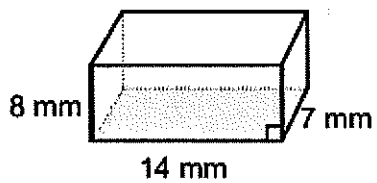


21. Using the figures below, find the surface area.

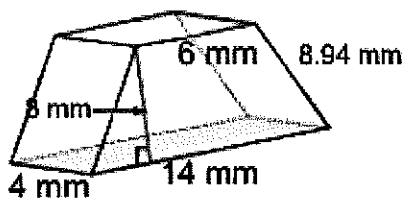
a.)



b.)



c.)



22. The price of a new car is \$29,990.

If the sales tax rate is 6.5%, then how much sales tax is being charged?

What is the total cost for the car including tax?

23. Ms. Acton spent \$205 at Target. Her total after tax was \$217.30. What is the percent sales tax in this area?

24. If the sales tax rate on clothing is 7.375% in New York State, then how much sales tax would you pay in Albany for a \$34 pair of pants?

25. At Best Buy they have a 42" TV that sells for \$1250 and is on sale for 15% and sales tax is 6.5%. What is the final cost? [NOTE: you are taxed on the sales cost on the original cost]

26. Diana finds a skirt that she likes at the store for \$46. Diana has to pay a total of \$48.53 for the skirt. What is the percent sales tax in this state for clothing?

- ① Charles bought a box of fruit that contained only oranges and tangerines.
- There were 5 oranges for every 3 tangerines in the box.
 - There were 20 oranges in the box.

Which of the following proportions can be used to find x , the number of tangerines in the box?

- A. $\frac{5}{8} = \frac{x}{20}$
- B. $\frac{5}{8} = \frac{20}{x}$
- C. $\frac{5}{3} = \frac{x}{20}$
- D. $\frac{5}{3} = \frac{20}{x}$

- 2 What is the value of this expression?

$$6 + (-9) - (-4)$$

- A. -11
B. -7
C. 1
D. 19
- 3 Brayden adds $\frac{1}{3}$ cup of flour into a mixture every $\frac{1}{2}$ minute. What is the rate, in cups per minute, at which Brayden adds flour to the mixture?
- A. $\frac{1}{6}$
B. $\frac{1}{5}$
C. $\frac{2}{3}$
D. $\frac{3}{2}$

- 6 A carton of pens contains 4 blue pens, 3 red pens, 10 black pens, and 1 green pen. All the pens are the same size and shape. Harry will select a pen at random.

Which of the following best describes the probability that Harry will select a green pen?

- A. likely
- B. certain
- C. unlikely
- D. impossible

- 9 Emma noticed that the new admission fee for the zoo is 50% more than last year's fee. She wrote this expression to represent the new admission fee, where f represents last year's fee.

$$f + (0.50 \times f)$$

Which of the following expressions shows another way Emma could have represented the new admission fee?

- A. $1.5f$
- B. $150f$
- C. $f + 1.5$
- D. $f + 150$

- 13** The first number in a pattern is 8. Each following number is found by subtracting 9 from the previous number.

What is the fifth number in the pattern?

- A. -45
 - B. -40
 - C. -37
 - D. -28
- 16** What is the value of this expression?

$$12 \div 0.48$$

- A. 4
- B. 25
- C. 0.04
- D. 0.25

- 19 Ava and Jiao each swam a two-lap swimming race. Ava took 31.49 seconds to finish her first lap and 30.03 seconds to finish her second lap. Jiao finished her two-lap swimming race 1.76 seconds faster than Ava.

What was Jiao's total swimming time, in seconds, after she finished her two-lap race?

Enter your answer in the answer boxes at the top of the answer grid **and** completely fill the matching circles.

- 20 Which of the following is equivalent to this expression?

$$40 \div \frac{1}{4}$$

- A. $\frac{1}{4} \cdot 40$
B. $40 \cdot 4$
C. $\frac{1}{4} \div 40$
D. $40 \div 4$

- 21 The computer teacher at a middle school spent \$12,950 to buy a storage cart and 25 laptop computers. The total purchase is represented by this equation, where c stands for the cost of each laptop computer purchased.

$$25c + 450 = 12,950$$

What was the cost of each laptop computer that the teacher purchased?

- A. \$536
- B. \$518
- C. \$500
- D. \$475

- 24 This table shows the numbers of students in different age groups who participate and do not participate in sports in one school district, as well as the total number of students in each age group.

Participation in Sports

	Age Group (years)		
	7-10	11-14	15-18
Number of Students Who Participate	493	345	1,088
Number of Students Who Do Not Participate	147	249	1,384
Total Number of Students	640	594	2,472

What is the difference of the percentage of students in the 7-10 age group who participate in sports and the percentage of students in the 15-18 age group who participate in sports? Round your answer to the nearest whole percent.

Enter your answer in the answer boxes at the top of the answer grid **and** completely fill the matching circles.

26 A circular mirror has a circumference of 30π inches. What is the area of the mirror?

- A. 30π square inches
- B. 60π square inches
- C. 225π square inches
- D. 900π square inches

27 A television originally cost t dollars, including tax. Ricardo purchased the television when it was on sale for 35% off its original cost.

Which of the following expressions represents the final cost, in dollars, of the television Ricardo purchased?

- A. $t - 0.35$
- B. $t + 0.65$
- C. $0.35t$
- D. $0.65t$

- 30** A school cafeteria manager conducted a survey to determine the students' favorite hot lunch. Five different random samples of 100 students each completed the survey. The results are shown in this table.

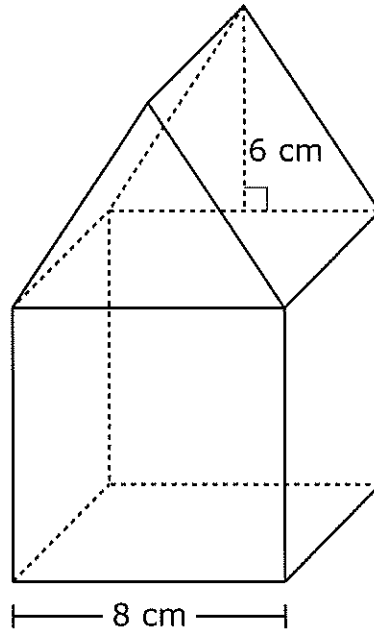
Favorite Hot Lunch

Sample	Grilled Cheese	Pizza	Chicken Nuggets
1	33	57	10
2	52	31	17
3	46	40	14
4	41	42	17
5	47	38	15

There are 2,000 students in the school. Based on the survey results, which of the following is closest to the expected total number of students whose favorite hot lunch is grilled cheese?

- A. 220
- B. 500
- C. 900
- D. 1,040

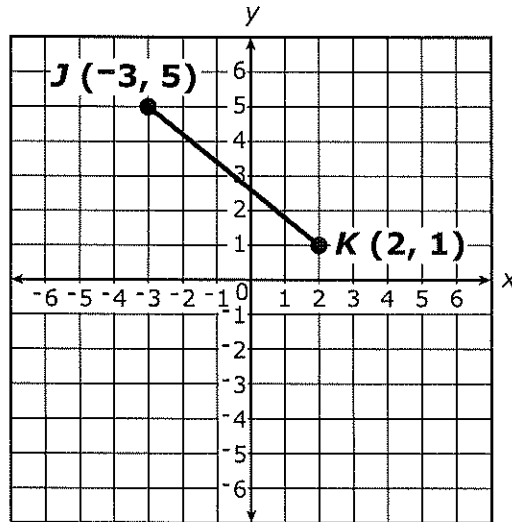
- 31 A solid figure is composed of a cube and a right triangular prism. The figure and some of its dimensions are shown in this diagram.



What is the volume of the figure?

- A. 560 cubic centimeters
- B. 704 cubic centimeters
- C. 728 cubic centimeters
- D. 896 cubic centimeters

- 37 Two vertices and one side of right triangle JKL are shown on this coordinate plane.



Which ordered pair could represent the location of vertex L of right triangle JKL ?

- A. $(-4, 1)$
- B. $(-3, 2)$
- C. $(1, 6)$
- D. $(2, 5)$

- 40 The members of a tennis team have a goal of raising at least \$500 for new equipment. They have already raised \$275. The team members plan to raise more money by washing cars. They will charge \$5 for each car they wash.

Let c represent the number of cars the team members will wash. Which of the following could be used to find the **least** number of cars they must wash to reach their goal?

- A. $5c - 275 > 500$
- B. $5c - 275 \geq 500$
- C. $5c + 275 > 500$
- D. $5c + 275 \geq 500$