

CHAPTER

23

TAKS TEST PREPARATION FOR MATH IN SCIENCE

Math Mini-Test 

Section 1

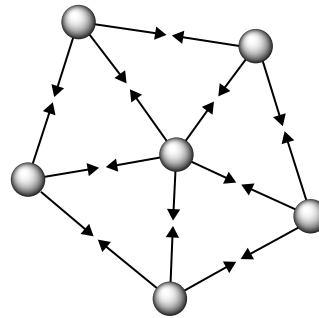
- 1** Mr. Star bought a telescope for \$87.75. He received a ten dollar bill, two one dollar bills, and a quarter as change. How much money did Mr. Star give the clerk?
- A** \$99
 - B** \$90
 - C** \$100
 - D** \$98

- 2** Larry saw three stars that could be connected to form a triangle. If two angles in the triangle are 30° and 60° , what type of triangle is it?
- F** Acute
 - G** Obtuse
 - H** Right
 - J** Equiangular

- 3** A group of seven babies have the following lengths: 49 cm, 51 cm, 54 cm, 55 cm, 58 cm, 58 cm, and 61 cm. What is the median length?
- A** 55 cm
 - B** 58 cm
 - C** 12 cm
 - D** About 55.1 cm

- 4** Earth travels at a speed of about 30 km/s around the sun. Which expression can be used to determine how many kilometers Earth travels in one hour?
- F** 30×60^2
 - G** 30×60^3
 - H** 30×60
 - J** $30^2 \times 60^2$

- 5** The diagram below shows how gravity causes the particles in a nebula to be attracted to one another. What is the shape of this diagram?



- A** Triangle
- B** Pentagon
- C** Hexagon
- D** Nonagon

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Math Mini-Test 

Section 2

1 Mrs. Walcott ordered a twice-monthly magazine subscription to *Planetary Motion*. If the price of each magazine is \$2.50, what does a one-year subscription cost?

- A** \$5.00
- B** \$60.00
- C** \$30.00
- D** \$15.00

2 A number cube with faces numbered 1 through 6 was tossed 240 times. What is a reasonable prediction of the number of times the cube will land with the number 6 facing up?

- F** 24
- G** 40
- H** 60
- J** 120

3 Which is equal to 800 cm?

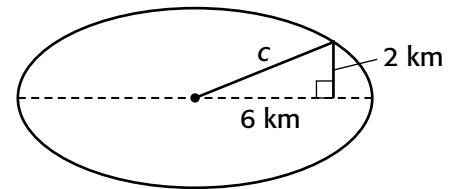
- A** 8 m
- B** 0.8 m
- C** 8 km
- D** 0.8 km

4 What is the amount of gravitational attraction between two objects that are moved 15 times as far apart?

Distance two objects are moved apart	Amount of gravitational attraction between them
2 times as far	4 times less
3 times as far	9 times less
4 times as far	16 times less
10 times as far	100 times less
15 times as far	? times less

- F** 15 times less
- G** 30 times less
- H** 225 times less
- J** 120 times less

5 Find the length, to the nearest whole number, of side *c* of the triangle in the diagram below.



- A** 6 km
- B** 40 km
- C** 8 km
- D** 3 km



Reading Mini-Test **Section 1**

Read the passage. Then read each question that follows the passage. Decide which is the best answer to each question.

The balance between gravity and pressure in a nebula can be upset. This could happen if two nebulas collide, or if a nearby star explodes, sending shock waves through the nebula. These events compress, or push together, small regions of a nebula so much that the pull of gravity can cause the nebula to collapse. As the matter in a nebula collapses inward, the temperature increases and the stage is set for stars to form. The solar nebula, the cloud of gas and dust that formed our solar system, may have formed when a nearby star exploded.

- 1** The word nebula in the passage means
 - A** planet.
 - B** astronomy.
 - C** an explosion that occurs in space.
 - D** a cloud in space made of gas and dust.
- 2** According to the passage, which of these events happens last?
 - F** Small regions of a nebula are pushed together.
 - G** Stars begin to form.
 - H** The pull of gravity causes the nebula to collapse.
 - J** Two nebulas collide.
- 3** Which of the following is a conclusion that can NOT be drawn from the passage?
 - A** An exploding star sends out shock waves.
 - B** Nebulas are among the most beautiful of astronomical formations.
 - C** Gravity can cause a nebula to collapse.
 - D** Our solar system may have formed because of a star's explosion.
- 4** Which is the best summary of the passage?
 - F** Nebulas usually balance gravity and pressure.
 - G** Our solar system was once the solar nebula.
 - H** If nebulas are compressed, they can form stars.
 - J** When small regions of a nebula are pushed together, other regions expand to compensate.



CHAPTER

23

TAKS TEST PREPARATION FOR READING IN SCIENCE

Reading Mini-Test **Section 2**

Read the passage. Then read each question that follows the passage. Decide which is the best answer to each question.

Newton reasoned that an object falls toward the Earth because the Earth and the object are attracted to each other by the force of gravity. Newton's law of universal gravitation states that the force of gravity depends on the product of the masses of the two objects divided by the square of the distance between them.

If two objects are moved twice as far apart, the gravitational attraction between them will decrease by 2×2 (a factor of 4). If two objects are moved ten times as far apart, the gravitational attraction between them will decrease by 10×10 (a factor of 100).

- 1 What is the best summary of the first paragraph?
 - A According to Newton's law of universal gravitation, objects and the Earth are attracted to each other by a force dependent only on their masses.
 - B According to Newton's law of universal gravitation, objects and the Earth are attracted to each other by a force dependent on their masses and the distance between them.
 - C Gravitational force is not something that scientists can describe.
 - D Gravity causes objects at a certain distance to be moved twice as far apart from each other.
- 2 According to the passage, if two objects were moved 3 times farther apart, the gravitational attraction between them would decrease by a factor of
 - F 3.
 - G 4.
 - H 9.
 - J 100.
- 3 According to the passage, which two objects would have the greatest force of gravity between them?
 - A A massive, large planet close to another massive, large planet
 - B A massive, large planet far away from another massive, large planet
 - C A less massive, small planet close to another less massive, small planet
 - D A less massive, small planet far away from another less massive, small planet
- 4 What is the main idea of the second paragraph?
 - F When two objects are moved apart, the gravitational attraction between them decreases by a certain amount.
 - G When two objects are moved apart, the gravitational attraction between them increases by a certain amount.
 - H Objects fall toward Earth because of gravity.
 - J The distance between two objects decreases when the objects are in space.



Answer Key and TAKS Doctor for Mini-Tests

Section 1

Answers	TEKS Correlation	TAKS Objectives
1 C	M 7.13C	6
2 H	M 7.6B	3
3 A	M 7.12A	5
4 F	M 7.13A	6
5 B	M 7.6B	3



The following TAKS questions have been diagnosed by the TAKS Doctor. Find out what might be causing your “ailing” answers. The TAKS Doctor will see you now!

Item 3 asks students to find the median of a set of data.

- A Correct.** When data is arranged in order, the median is the middle number. Therefore, the median of this set is 55.
- B Incorrect.** This is the mode of the set of data. The mode is the number that occurs most frequently in a sequence.
- C Incorrect.** This is the range of the set of data. The range is the difference between the highest and lowest numbers in a sequence.
- D Incorrect.** This is the mean of the set of data. The mean is the sum of all the numbers divided by the number of numbers in the set.

Item 4 asks students to express the conversion from kilometers per second to kilometers per hour.

- F Correct.** A minute has 60 seconds. The distance Earth travels in one minute is found by multiplying 30 km/s by 60 s/min. This equals 1800 km/min. The distance Earth travels in 1 hour is found by multiplying 1800 km/min by 60 min/h, which equals 108,000 km/h. The multiplication done to reach this answer can be simplified to 30×60^2 .
- G Incorrect.** This answer is the distance Earth would travel in 60 hours, not in 1 hour.
- H Incorrect.** This is the distance Earth would travel in 1 min, not 1 hour.
 $30 \text{ km/s} \times 60 \text{ s/min} = 1800 \text{ km/min}$.
- J Incorrect.** There is no reason to square the number of kilometers Earth travels per second. The correct answer is found by multiplying the number of seconds in a minute by the number of minutes in an hour, then multiplying the product by the distance traveled per second.

*Answer Key and TAKS Doctor for Mini-Tests***Section 2**

Answers	TEKS Correlation	TAKS Objectives
1 B	M 7.2F	1
2 G	M 7.2B	1
3 A	M 7.2F	1
4 H	M 7.11B	5
5 A	M 7.13B	6



The following TAKS questions have been diagnosed by the TAKS Doctor. Find out what might be causing your “ailing” answers. The TAKS Doctor will see you now!

Item 1 asks students to determine the price of a one-year magazine subscription.

- A Incorrect.** This answer is reached by multiplying \$2.50 by 2. This would be the correct price of the subscription if it were a twice-yearly subscription, not a twice-monthly subscription.
- B Correct.** A twice-monthly subscription will come 2 times a month for 12 months, or 24 times a year. The total cost is found by multiplying 24 by \$2.50, which equals \$60.00 per year.
- C Incorrect.** This answer would be correct if the magazine came once monthly ($12 \times \$2.50 = \30.00). However, the magazine comes twice monthly, so the price must be doubled (\$60.00).
- D Incorrect.** This answer would be correct if the magazine came every other month instead of two times a month. If it came every other month, it would become $\frac{1}{2} \times 12$ months = 6 times a year. $6 \times \$2.50 = \15.00

Item 5 asks students to find the value of c in the diagram.

- A Correct.** Because this is a right triangle, $a^2 + b^2 = c^2$. Thus, $2^2 + 6^2 = c^2$; $c^2 = 40$ and $c = \sqrt{40}$, or about 6.
- B Incorrect.** This is the correct value for c^2 ; $c = \sqrt{40}$.
- C Incorrect.** This answer indicates that the formula used was $a + b = c$. However, because this is a right triangle, $a^2 + b^2 = c^2$, and $2^2 + 6^2 = c^2$.
- D Incorrect.** This answer is reached by using the formula $a + b = c^2$. However, because this is a right triangle, the correct formula to use is $a^2 + b^2 = c^2$, or $2^2 + 6^2 = c^2$.

*Answer Key and TAKS Doctor for Mini-Tests***Section 1**

Answers	TEKS Correlation	TAKS Objectives
1 D	R 7.6A	
2 G	R 7.10E	3
3 B	R 7.10H	4
4 H	R 7.10G	1



The following TAKS questions have been diagnosed by the TAKS Doctor. Find out what might be causing your “ailing” answers. The TAKS Doctor will see you now!

Item 1 asks students to use context to define the word *nebula*.

- A Incorrect.** According to the last sentence, the solar nebula is the cloud of gas and dust that formed our solar system. It can be inferred from this that a nebula is a cloud of gas and dust, not a planet.
- B Incorrect.** The first two sentences make it clear that a nebula is an object, not a scientific pursuit.
- C Incorrect.** The second sentence explains what might happen if a star near a nebula explodes; because a nebula is affected by an explosion, it is not likely that a nebula itself is an explosion.
- D Correct.** The last sentence states that the solar nebula is the cloud of dust and gas that formed our solar system. This supports the definition of *nebula* as a cloud in space made of gas and dust.

Item 4 asks students to identify the best summary of the passage.

- F Incorrect.** Although the first sentence refers to the balance of gravity and pressure in a nebula, the rest of the passage goes on to describe what happens when nebulas are compressed. Therefore, this is not a summary of the passage, but a supporting detail from it.
- G Incorrect.** This fact is stated in the last sentence, but it is given as an example of the processes described in the passage. It is a supporting detail, not a summary of the passage.
- H Correct.** The passage begins by describing the balance between gravity and pressure, then goes on to describe how stars form when nebulas are compressed and this balance is upset. Because this statement describes most of the material presented in the passage, it is the best summary of the passage.
- J Incorrect.** The third sentence does refer to small regions of a nebula being compressed, but there is no mention in the passage of other regions expanding to compensate.

*Answer Key and TAKS Doctor for Mini-Tests***Section 2**

Answers	TEKS Correlation	TAKS Objectives
1 B	R 7.10G	1
2 H	R 7.10H	4
3 A	R 7.10H	4
4 F	R 7.10F	1



The following TAKS questions have been diagnosed by the TAKS Doctor. Find out what might be causing your “ailing” answers. The TAKS Doctor will see you now!

Item 1 asks students to identify the best summary of the first paragraph.

- A Incorrect.** According to the second sentence, Newton’s law states that the attraction between objects is dependent not only on their masses, but also on the distance between them.
- B Correct.** The first sentence explains how Newton reasoned that the force of gravity works to cause objects to fall to Earth, and the second sentence explains how the force of gravity between two objects can be determined.
- C Incorrect.** Although it is true that scientists do not fully understand gravity, this passage is evidence that the force of gravity can be described.
- D Incorrect.** Gravity causes objects to be pulled together, not moved apart.

Item 4 asks students to identify the main idea of the second paragraph.

- F Correct.** The paragraph gives two examples of objects being moved apart in order to convey this idea.
- G Incorrect.** As both examples in the paragraph indicate, the attraction between two objects decreases when the objects are moved apart; it does not increase.
- H Incorrect.** This fact is stated in the first sentence of the first paragraph, but it is not the main idea of the second paragraph.
- J Incorrect.** There is nothing in the passage to indicate that the distance between objects decreases when the objects are in space.