

Practicing for Standardized Tests

As you work closely with your classmates and teachers on a daily basis, they will have a good idea of what you know and are able to do with respect to the mathematics you are studying this year. However, your school district or state department of education may ask you to take tests that they design to measure the achievement of all students, classes, or schools in the district or state. Colleges also use such external *standardized* tests like the PSAT (Preliminary Scholastic Aptitude Test) to compare the knowledge of different students who will soon be applying for admission or scholarships.

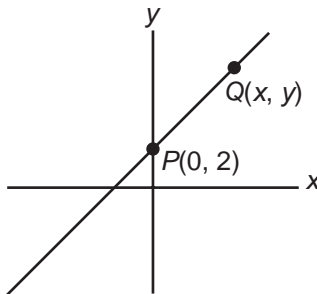
External standardized tests usually present assessment tasks in formats that can be easily scored to produce simple percent-correct ratings of your knowledge. If you want to perform well on such standardized tests, it helps to have some practice with test items in multiple-choice formats. The following ten sets of multiple-choice tasks have been designed to give you that kind of practice and to offer some strategic advice in working on such items. You will find helpful *Test Taking Tips* at the end of each of the practice sets.

Practice Set 1

Solve each problem. Then record the letter that corresponds to the correct answer.

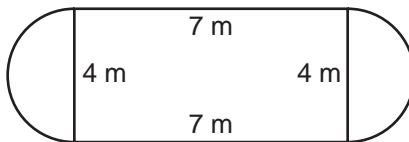
1. Which of the following coordinates for point Q will guarantee that line PQ has slope 2.5?

- (a) $Q(1, 2.5)$
 (b) $Q(1, 4.5)$
 (c) $Q(2, 1)$
 (d) $Q(2.5, 3)$
 (e) $Q(4, 1)$



2. The following figure is made up of a rectangle with a semicircle attached to both ends. The area in square meters of the figure is

- (a) $22 + 4\pi$
 (b) $28 + 4\pi$
 (c) $22 + 8\pi$
 (d) $22 + 16\pi$
 (e) $28 + 16\pi$

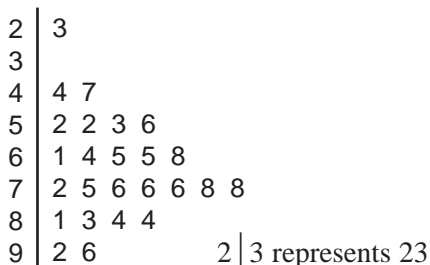


3. Solve $\frac{2}{3}x + 5 = \frac{1}{2}(x + 4)$ for x .

- (a) $x = -18$ (b) $x = -11$ (c) $x = -6$ (d) $x = -1$ (e) $x = 18$

4. The median of the test scores displayed in the stem-and-leaf plot below is:

- (a) 68
 (b) 72
 (c) 75
 (d) 76
 (e) 78



5. If \$1,000 is invested at 8% annual interest, in about how many years will the balance double?

- (a) 2 (b) 6 (c) 9 (d) 12 (e) 13

Practice Set 1

6. Which of the following expressions are equivalent to $12x$?

I. $7 + 5x$

II. $12x^2 - x$

III. $7x + 5x$

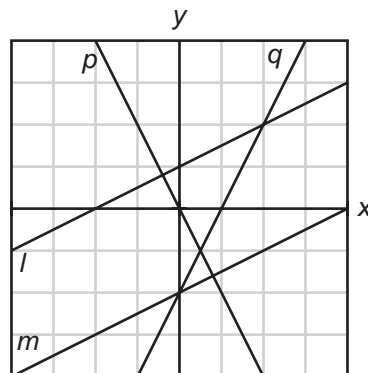
- (a) I only (b) I and II (c) II only (d) III only (e) All of them

7. What is the degree measure of each interior angle of a regular pentagon?

- (a) 36° (b) 72° (c) 108° (d) 120° (e) 144°

8. Which of the lines shown is the graph of $y = \frac{1}{2}x - 2$? The scale on each axis is 1.

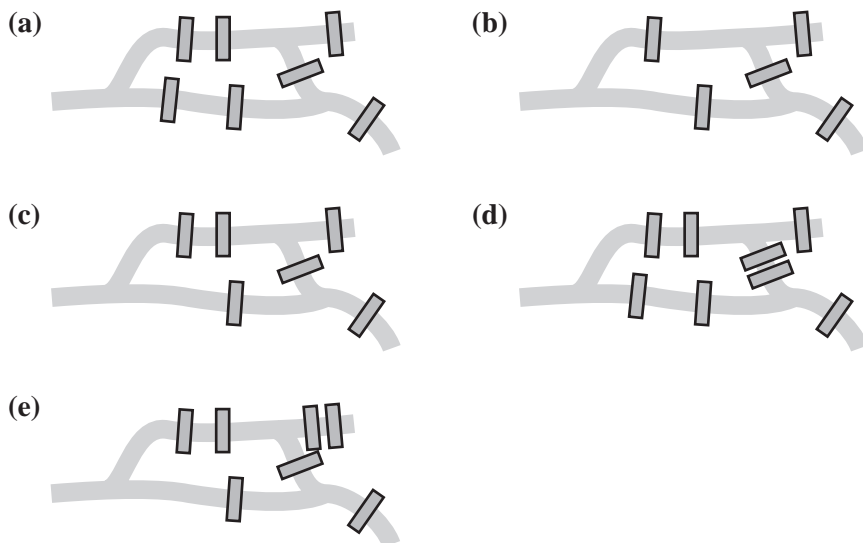
- (a) l (b) m (c) p
 (d) q (e) None of them



9. What is the equation of the line through the points $(4, 1)$ and $(8, 3)$?

- (a) $y = \frac{1}{2}x - 1$ (b) $y = \frac{1}{2}x + \frac{7}{2}$
 (c) $y = -\frac{1}{2}x + 7$ (d) $y = 2x - 7$
 (e) $y = 2x - 13$

10. Which configuration of bridges would allow people to tour the city by beginning at a point on land, walking across each bridge exactly once, and returning to the starting point?



Practice Set 1

Test Taking Tip

Work backwards from choices.

On multiple-choice tests, if you know how to solve a problem and are confident you can do it accurately and reasonably quickly, then that is the way to proceed. If you are unsure of how to solve it, then an alternative strategy is to work backwards by testing various answer choices to see which one is correct.

Example Look back at Item 9 on page 87. To use this strategy, test choice

(a): $y = \frac{1}{2}x - 1$. Coordinates of points on a line must satisfy the equation of the line. Substituting $x = 4$ gives $\frac{1}{2}(4) - 1 = 1$ which is the y -coordinate of the first point.

Substituting $x = 8$ gives $\frac{1}{2}(8) - 1 = 3$ which is the y -coordinate of the second point. So, the answer is (a).

- Find, if possible, another test item in the practice set for which this strategy might be helpful. Try it.
- Keep this strategy in mind as you work on future practice sets.

Practice Set 2

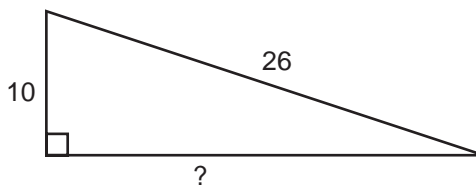
Solve each problem. Then record the letter that corresponds to the correct answer.

1. If $a = 2$, $b = 5$, and $c = 1$, then $3a + 2(b + c)$ is equal to:

- (a) 14
- (b) 17
- (c) 18
- (d) 48
- (e) 204

2. What is the length of the missing side of the triangle below?

- (a) 22
- (b) 24
- (c) 26
- (d) 34
- (e) 38



3. Suppose that 60% of an area's population subscribes to an Internet provider, and telemarketers must call phone numbers from the area at random until they reach 5 customers. A simulation of 20 trials is used to estimate how many calls it will take each telemarketer to reach 5 customers. The data from the trials is shown in the table below.

| Number of Calls to Reach 5 | Frequency | Relative Frequency |
|----------------------------|-----------|--------------------|
| 5 | 2 | 0.10 |
| 6 | 4 | 0.20 |
| 7 | 3 | 0.15 |
| 8 | 7 | 0.35 |
| 9 | 1 | 0.05 |
| 10 | 0 | 0.00 |
| 11 | 0 | 0.00 |
| 12 | 0 | 0.00 |
| 13 | 1 | 0.05 |
| 14 | 0 | 0.00 |
| 15 | 1 | 0.05 |
| 16 | 1 | 0.05 |

These simulated data suggest that on average one could expect to require about how many calls to find five customers?

- (a) 6
- (b) 7
- (c) 8
- (d) 10
- (e) 12

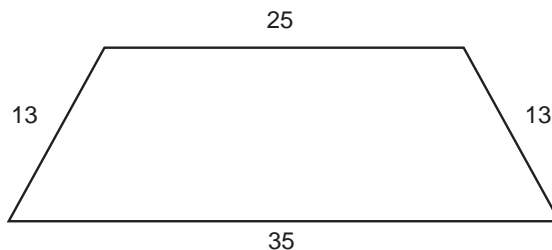
Practice Set 2

4. The solution of the inequality $6 - 3r > 15$ is:
- (a) $r < -3$
 - (b) $r > -3$
 - (c) $r < 3$
 - (d) $r > 3$
 - (e) $-3 < r < 3$
5. The length of a rectangle is three more than its width. If the width is represented by w , which expression represents the area of the rectangle?
- (a) $w^2 + 3w$
 - (b) $w^2 + 3$
 - (c) $4w + 6$
 - (d) $2w + 3$
 - (e) $8w$
6. What is the slope of the line through the points $(-2, 4)$ and $(10, 0)$?
- (a) -3
 - (b) -2
 - (c) $-\frac{1}{3}$
 - (d) $\frac{1}{3}$
 - (e) $\frac{1}{2}$
7. If a \$2,000 bicycle depreciates 20% each year, for how many years will the bicycle be worth more than \$500?
- (a) 0
 - (b) 3
 - (c) 4
 - (d) 6
 - (e) 8

Practice Set 2

8. What is the area in square units of the trapezoid below?

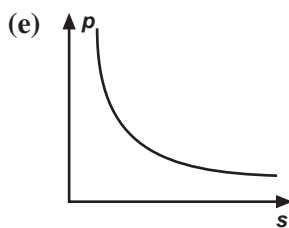
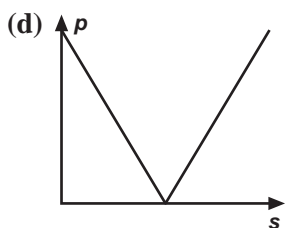
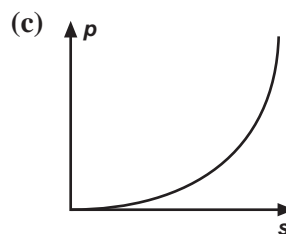
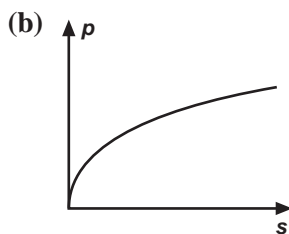
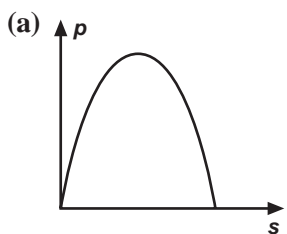
- (a) 86
- (b) 240
- (c) 360
- (d) 390
- (e) 455



9. What is the equation of the line through the point $(10, 1)$ with slope $\frac{2}{5}$?

- (a) $y = \frac{2}{5}x + \frac{48}{5}$
- (b) $y = \frac{2}{5}x + 1$
- (c) $y = \frac{2}{5}x - 3$
- (d) $y = \frac{2}{5}x - \frac{6}{5}$
- (e) $y = -3x + \frac{2}{5}$

10. Which of the following graphs shows that the price p of a product decreases as the supply s of the product increases?

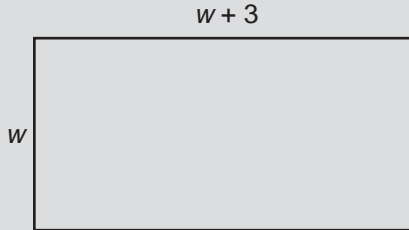


Practice Set 2

Test Taking Tip

If a diagram is not provided for a geometry problem, draw and label one.

Example Look back at Item 5 on page 90. To use this strategy, draw and label a rectangle as shown below.



Then the area $A = w(w + 3) = w^2 + 3w$. So, the answer is (a).

- Find another test item in the practice set for which this strategy might be helpful. Try it.
- Keep this strategy in mind as you work on future practice sets.

Practice Set 3

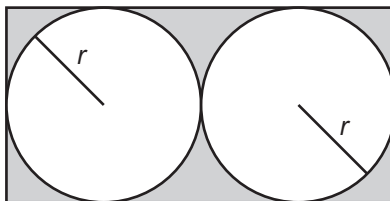
Solve each problem. Then record the letter that corresponds to the correct answer.

1. A traveling fair charges \$5 for admission and \$1 per ride. Suppose you go to the fair with \$13. Which inequality represents the number of rides r that you can afford?

- (a) $5r + 1 \leq 13$
- (b) $5r + 1 \geq 13$
- (c) $5 + r \leq 13$
- (d) $5 + r \geq 13$
- (e) None of these

2. What is the area in square units of the shaded region in the figure below?

- (a) $8 - 2\pi$
- (b) $2r(3 - 2\pi)$
- (c) $4r(2r - \pi)$
- (d) $8r(1 - 2\pi r)$
- (e) $2r^2(4 - \pi)$



3. What is the slope of the line passing through the points $(1, 2)$ and $(-3, 9)$?

- (a) $-\frac{11}{2}$
- (b) $-\frac{7}{4}$
- (c) $-\frac{4}{7}$
- (d) $-\frac{2}{11}$
- (e) $\frac{7}{2}$

4. What is the mean of the degree measures of the angles of a triangle?

- (a) 45°
- (b) 60°
- (c) 90°
- (d) 180°
- (e) It will depend on the triangle.

Practice Set 3

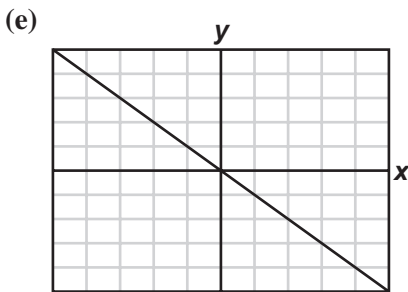
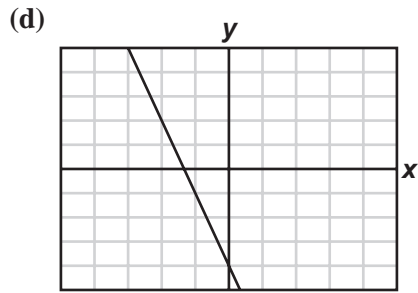
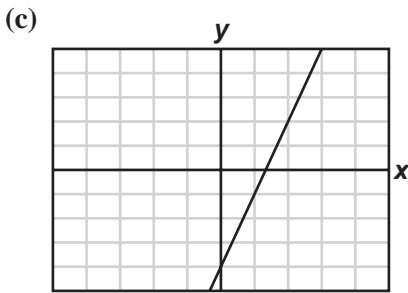
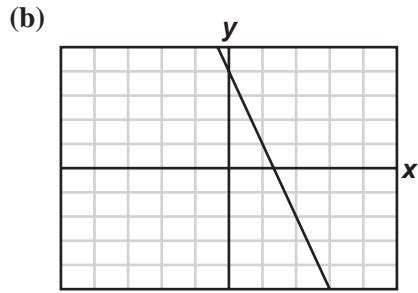
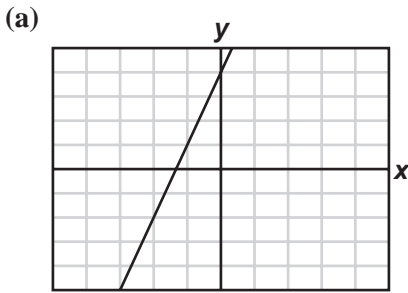
5. Lita earns \$250 per week plus 8% commission on her sales. She must earn at least \$300 each week to cover her expenses. What is the minimum amount of sales each week that will enable her to cover her expenses?
- (a) \$62.50
 - (b) \$68.75
 - (c) \$625.00
 - (d) \$687.50
 - (e) \$3,750.00
6. What is the equation of the line passing through the point $(3, -6)$ and having slope $-\frac{4}{3}$?
- (a) $y = -\frac{4}{3}x - 6$
 - (b) $y = -\frac{4}{3}x - 5$
 - (c) $y = -\frac{4}{3}x - 2$
 - (d) $y = -\frac{4}{3}x + 11$
 - (e) $y = -\frac{4}{3}x + 2$
7. Which figure cannot be used to tile a plane?
- (a) A triangle
 - (b) A regular hexagon
 - (c) A trapezoid
 - (d) A quadrilateral
 - (e) A regular octagon
8. Which equation is not an example of a linear equation?
- (a) $2x + 5y = 3$
 - (b) $y = -10 + 2x$
 - (c) $5 = 3x$
 - (d) $y = \frac{1}{x} + 4$
 - (e) $2^2 + 3x = y$

Practice Set 3

9. Which of the following is equivalent to a^6 ?

- (a) a^2a^3
- (b) a^2a^4
- (c) $a^2 + a^3$
- (d) $a^2 + a^4$
- (e) $2(a^3)$

10. Which graph could represent the equation $y = 4 - 3x$?



Practice Set 3

Test Taking Tip

Replace variables with numbers.

When comparing expressions, it is sometimes helpful to replace each variable with an easy-to-use but not special number. If you find one number for which the expressions are not the same, then the expressions are not equivalent.

Example Look back at Item 9 on page 95. To use this strategy, replace a with 2. Then $a^6 = 64$.

For choice (a): $2^2 \cdot 2^3 = 4 \cdot 8 = 32$. $32 \neq 64$

For choice (b): $2^2 \cdot 2^4 = 4 \cdot 16 = 64$.

Explain why choices (c), (d), and (e) are not correct choices. So, the answer is (b).

- Find, if possible, another test item in the practice set for which this strategy might be helpful. Try it.
- Keep this strategy in mind as you work on future practice sets.

Practice Set 4

Solve each problem. Then record the letter that corresponds to the correct answer.

1. What is the slope of the line through the points $(-1, -2)$ and $(4, 1)$?

(a) -3

(b) $-\frac{3}{5}$

(c) $-\frac{1}{3}$

(d) $\frac{3}{5}$

(e) $\frac{5}{3}$

2. What is the area in square units of the trapezoid below?

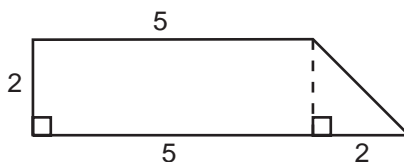
(a) 12

(b) 14

(c) $14 + 2\sqrt{2}$

(d) 20

(e) 24



3. The expression $4 + 8(t - 2)$ is equivalent to:

(a) $12t - 2$

(b) $12t - 24$

(c) $8t - 12$

(d) $8t + 2$

(e) $8t + 20$

4. When $2x - 3y = 6$ is solved for y , which equation results?

(a) $-3y = 6 - 2x$

(b) $y = -2 - 2x$

(c) $y = -2 - \frac{2}{3}x$

(d) $y = -2 + \frac{2}{3}x$

(e) $y = 2 - \frac{2}{3}x$

Practice Set 4

5. The solution of the inequality $6d + 10 < 28$ is

- (a) $d < -3$
- (b) $d > -3$
- (c) $-3 < d < 3$
- (d) $d < 3$
- (e) $d > 3$

6. The number of respondents to a survey that rated their health in each of four categories is given in the following table.

| Condition of Health | Frequency |
|---------------------|-----------|
| Excellent | 437 |
| Good | 697 |
| Fair | 258 |
| Poor | 69 |
| Total | 1,461 |

About what percent of the respondents rated their health as at least “Good”?

- (a) 20%
 - (b) 30%
 - (c) 50%
 - (d) 70%
 - (e) 80%
7. What is the equation of the line parallel to $y = \frac{2}{3}x - 7$ that passes through the point (6, 3)?
- (a) $y = \frac{2}{3}x - 1$
 - (b) $y = \frac{3}{2}x - 6$
 - (c) $y = \frac{2}{3}x + 4$
 - (d) $y = \frac{3}{2}x + \frac{3}{2}$
 - (e) $y = \frac{2}{3}x - 4$

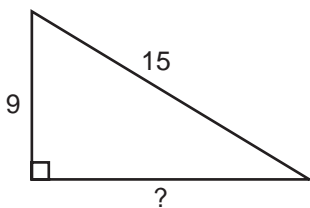
Practice Set 4

8. A man-made lake is initially stocked with 500 fish. The population is expected to increase about 20% each year. If the lake can't support more than 2,000 fish, in about how many years will the lake become overpopulated with fish?

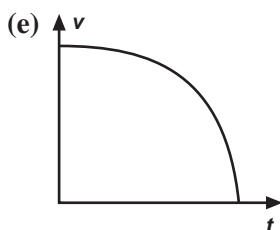
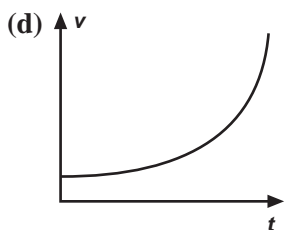
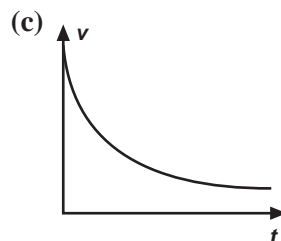
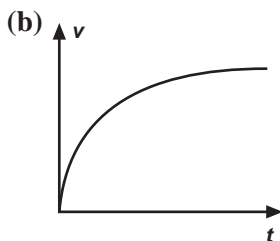
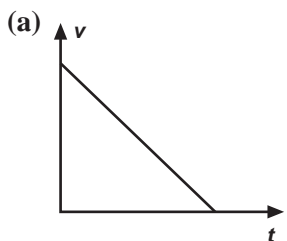
- (a) 3
- (b) 8
- (c) 15
- (d) 20
- (e) It will never become overpopulated with fish.

9. What is the length, in units, of the missing side of the triangle below?

- (a) 2
- (b) 6
- (c) 11
- (d) 12
- (e) 17



10. Which graph best represents the 15% annual depreciation in value v over time t of an object?

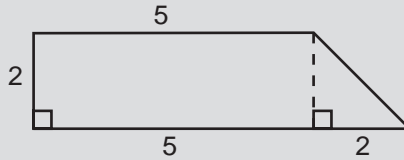


Practice Set 4

Test Taking Tip

Break complex geometric shapes into simpler shapes if a particular formula cannot be remembered.

Example Look back at Item 2 on page 97. To use this strategy, draw a perpendicular segment in the diagram as shown below.



Then calculate the areas of the rectangle and right triangle and add:
 $10 + \frac{1}{2}(4) = 12$ square units. The answer is (a).

- Find, if possible, another test item in the practice set for which this strategy might be helpful. Try it.
- Keep this strategy in mind as you work on future practice sets.

Practice Set 5

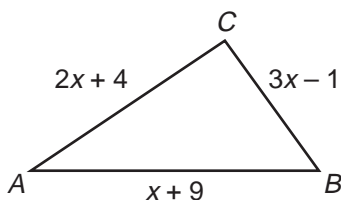
Solve each problem. Then record the letter that corresponds to the correct answer.

1. For what value of x will the line passing through $(-1, 4)$ and $(x, 7)$ have a slope of $\frac{1}{3}$?

- (a) -2
- (b) 0
- (c) 2
- (d) 8
- (e) 10

2. If the perimeter of $\triangle ABC$ is 30 cm, then what is the length in centimeters of the longest side?

- (a) 3
- (b) 8
- (c) 10
- (d) 12
- (e) 16



3. The solution of the inequality $\frac{t+2}{5} \geq 1$ is:

- (a) $t \geq -5$
- (b) $t \leq -1$
- (c) $t \leq 3$
- (d) $t \geq 3$
- (e) $t \geq 5$

4. If $x + y = 12$, $y + z = 20$, and $x + z = 4$, what is the average (mean) of x , y , and z ?

- (a) 4
- (b) 6
- (c) 12
- (d) 18
- (e) It cannot be determined from the information given.

Practice Set 5

5. Which system of equations has more than one solution?

(a) $y = 2(x + 3)$
 $y = 2x - 7$

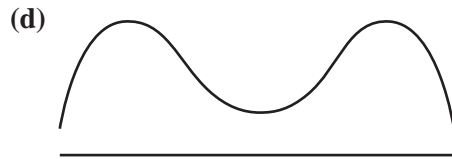
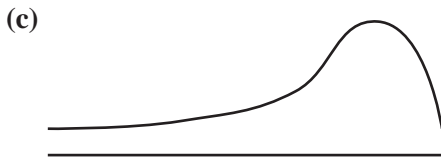
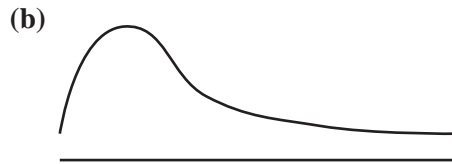
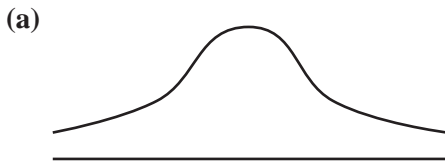
(b) $y = 3(x - 1)$
 $y = \frac{1}{3}x - 3$

(c) $y = 4(x + 2)$
 $y = 8 + 4x$

(d) $2x + 3y = 6$
 $8x + 12y = 6$

(e) None of these

6. In which distribution would you expect the mean to be less than the median?



(e) All are possible.

7. The cost of a catered event can be modeled by a linear equation. The cost is \$1,050 for 50 guests and \$1,550 for 75 guests. How much will dinner cost if 125 guests attend?

(a) \$2,550.00

(b) \$2,575.00

(c) \$2,583.33

(d) \$2,600.00

(e) \$2,625.00

Practice Set 5

8. What is the value of x in the figure below?

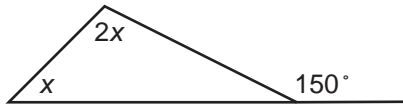
(a) 10°

(b) 15°

(c) 30°

(d) 50°

(e) 150°



9. At Best Videos, the regular price for used videos is d dollars. How many videos can be purchased for x dollars when Best Videos is having a clearance sale and all used videos are on sale at 40% off the regular price?

(a) $x - 0.6d$

(b) $x - 0.4d$

(c) $0.6xd$

(d) $\frac{x}{0.4d}$

(e) $\frac{x}{0.6d}$

10. If the angles of a quadrilateral are in the ratio 1:2:3:3, what is the degree measure of the smallest angle?

(a) 20

(b) 40

(c) 60

(d) 80

(e) 120

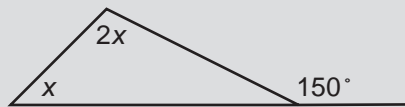
Practice Set 5

Test Taking Tip

Memorize important facts and formulas.

Some standardized tests provide a list of commonly used area and volume formulas and facts such as: *The measure in degrees of a straight angle is 180° , or the sum of the measures in degrees of the angles of a triangle is 180° .* Standardized tests are timed tests often allowing an average of one minute per question. You can save precious time on these tests if you memorize facts such as those above.

Example Look back at Item 8 on page 103. By being able to quickly recall the above two facts about angles, you can reason that the unlabeled angle in the triangle has degree measure 30 since $30 + 150 = 180$.



Then, since $x + 2x + 30 = 180$, $3x = 150$ and $x = 50^\circ$ (Choice d).

- Find, if possible, another test item in the practice set for which having memorized these facts about angles would be helpful.
- Look back at previous practice sets and make a list of facts and formulas that were frequently needed and memorize them.
- Keep these facts and formulas in mind and add others to your list as you work on future practice sets.

Practice Set 6

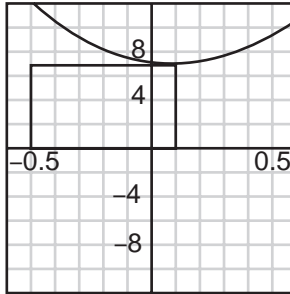
Solve each problem. Then record the letter that corresponds to the correct answer.

- The inequality $5z - 4 > 2z + 8$ is equivalent to which inequality?
 - $z < 1$
 - $z > 1$
 - $z < 4$
 - $z > 4$
 - $z > 12$
- What is the approximate length in inches of the diagonal of a rectangle that is 25 inches long by 20 inches wide?
 - 15
 - 22
 - 27
 - 32
 - 45
- Suppose a new car is purchased for \$22,000, and its value is predicted to decrease by 15% each year. Which equation gives the car's value V in thousands of dollars t years after its purchase?
 - $V = 22(-0.15^t)$
 - $V = 22(-0.15^t)$
 - $V = 22(0.85^t)$
 - $V = -0.15(22^t)$
 - $V = 18.7^t$
- What is the equation of the line that contains the point $(4, -2)$ and has a slope of $\frac{5}{2}$?
 - $y = \frac{5}{2}x - 12$
 - $y = \frac{5}{2}x - 8$
 - $y = \frac{5}{2}x - 1$
 - $y = \frac{5}{2}x + 9$
 - $y = \frac{5}{2}x + 12$

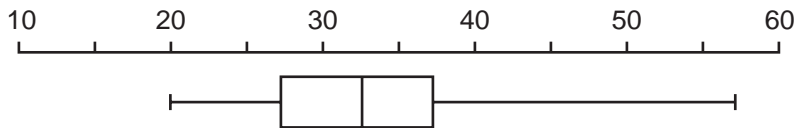
Practice Set 6

5. What is the area in units of the rectangle shown in the figure below? The top of the rectangle is tangent to the curve with equation $y = 15x^2 - 3x + 7$.

- (a) -2.74
- (b) 2.74
- (c) 4.11
- (d) 4.47
- (e) 4.90



6. The box plot below shows the price in dollars of twenty models of cordless phones.



Which of the following statements is **not** true?

- (a) The median price is about \$32.
 - (b) There are more cordless phones that cost more than \$36 than cost less than \$27.
 - (c) The upper quartile is about \$36.
 - (d) The least expensive model is about \$20.
 - (e) About 25% of the phones cost more than \$36.
7. The following formula relates temperature in degrees Celsius (C) and temperature in degrees Fahrenheit (F):

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

What is the equivalent of $15^\circ C$ in degrees Fahrenheit?

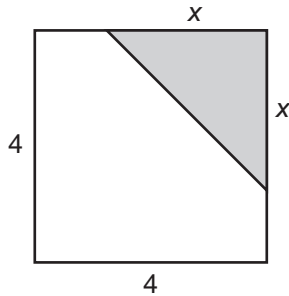
- (a) $-\frac{85}{9}$
- (b) 9
- (c) 15
- (d) 59
- (e) 85

Practice Set 6

8. The base of a rectangular box measures 3.5 inches by 7.5 inches. What is the height, in inches, of the box if its volume is approximately 300 cubic inches?
- (a) 11.5
 - (b) 13.5
 - (c) 23.25
 - (d) 27
 - (e) 289

9. What is the value of x if the area of the triangle is $\frac{1}{4}$ the area of the square?

- (a) $\sqrt{2}$
- (b) $2\sqrt{2}$
- (c) 4
- (d) 8
- (e) $8\sqrt{2}$



10. If $x^2 = 25$ and $y^2 = 16$, what is the smallest possible value for $(x + y)^2$?
- (a) -81
 - (b) -1
 - (c) 1
 - (d) 9
 - (e) 81

Practice Set 6

Test Taking Tip

Answer the easy questions first; then answer the more difficult ones.

Most standardized tests have a time limit, so you should carefully budget your time. Some questions will be easier than others. If after reading a question you immediately know how to do it, then you should do it right away. If you are not sure, try to get started on it; perhaps by using one of the previous test taking tips. If you have not made any progress within 30 seconds or so, circle the item and go on to the next question. If there is still time left when you get to the end of the test, go back to the items you circled.

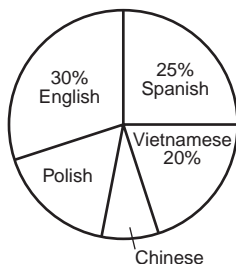
- Look back over the items in this practice set. Which ones were you able to answer in a minute or less? If you would have been using this test taking tip, which items would you have circled as items to come back to if time remained?
- Keep this strategy in mind as you work on future practice sets.

Practice Set 7

Solve each problem. Then record the letter that corresponds to the correct answer.

1. The circle below shows which languages students in Greenwood Valley's Headstart Classes primarily speak. If there are 120 students in the headstart program and there are twice as many Polish-speaking students as there are Chinese-speaking students, how many Polish-speaking students are there?

- (a) 10
- (b) 20
- (c) 30
- (d) 40
- (e) 60



2. The cost of ordering custom T-shirts can be modeled by a linear equation. If 50 T-shirts cost \$360 and 100 T-shirts cost \$685, how much will 80 T-shirts cost?

- (a) \$520
- (b) \$548
- (c) \$555
- (d) \$576
- (e) \$600

3. The area of a circle is 36π square units. What is its circumference?

- (a) 6π units
- (b) 12π units
- (c) 18π units
- (d) 36π units
- (e) 72π units

4. A jar contains 30 marbles: 10 red, 5 white, and 15 blue. If you randomly remove one marble at a time, what is the minimum number of marbles that you must remove to be certain that you have one of each color?

- (a) 3
- (b) 16
- (c) 21
- (d) 26
- (e) 27

Practice Set 7

5. Which expression describes the perimeter of the rectangle below?

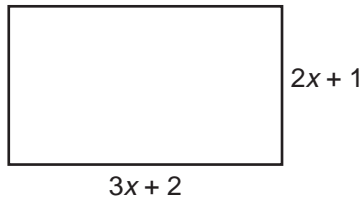
(a) $10x^4 + 6$

(b) $5x + 3$

(c) $5x^2 + 3$

(d) $(3x + 2)(2x + 1)$

(e) $10x + 6$



6. Which expression is equivalent to $5 + 2(3n + 1)$?

(a) $21n + 1$

(b) $6n + 6$

(c) $21n + 7$

(d) $11n + 2$

(e) $6n + 7$

7. What is the degree measure of the smallest angle of rotational symmetry of a regular pentagon?

(a) 36

(b) 54

(c) 72

(d) 90

(e) 108

8. Musicexpress.com is offering Grammy-nominated CDs for \$7.95 each plus a shipping/handling charge of \$14.95 for the entire order. How many CDs could you purchase with a \$100 gift certificate?

(a) 4

(b) 6

(c) 10

(d) 11

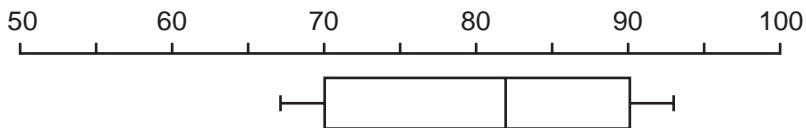
(e) 12

Practice Set 7

9. If $3^{x+2} = 243$, what is the value of 2^{x+4} ?

- (a) 3
- (b) 12
- (c) 24
- (d) 64
- (e) 128

10. About what percentage of the students scored between 70 and 90 on the test depicted in the box plot below?



- (a) 40
- (b) 50
- (c) 75
- (d) 90
- (e) Cannot be determined from information given

Practice Set 7

Test Taking Tip

Use the table-building capability of your calculator to aid in reasoning with complicated function rules.

Sometimes algebraic expressions on standardized tests may be unfamiliar to you or intimidating because of their complexity. In these cases, thinking about the meaning of the symbols and using the table-building capability of your calculator may be helpful.

Example Look back at Item 9 on page 111. To use this strategy, enter 3^{x+2} in the $y =$ menu of your graphing calculator and produce a table. Be careful to use parentheses correctly.

| | | |
|--------|-------------|--------|
| Plot 1 | Plot 2 | Plot 3 |
| \Y1 = | $3^{(X+2)}$ | |
| \Y2 = | | |
| \Y3 = | | |
| \Y4 = | | |
| \Y5 = | | |
| \Y6 = | | |
| \Y7 = | | |

| X | Y1 | |
|---|------|--|
| 0 | 9 | |
| 1 | 27 | |
| 2 | 81 | |
| 3 | 243 | |
| 4 | 729 | |
| 5 | 2187 | |
| 6 | 6561 | |

X=3

Scanning the table, you see that when $x = 3$, $3^{x+2} = 243$.

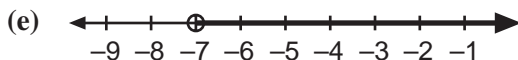
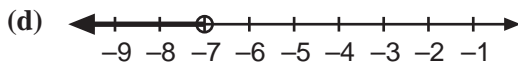
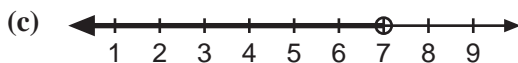
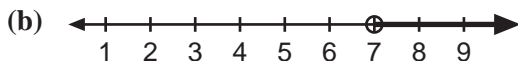
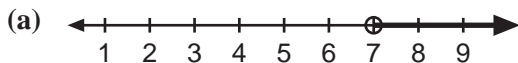
So, $2^{x+4} = 2^{3+4} = 2^7 = 128$. The answer is (e).

- Find, if possible, another test item in the practice set for which this strategy might be helpful. Try it.
- Keep this strategy in mind as you work on future practice sets.

Practice Set 8

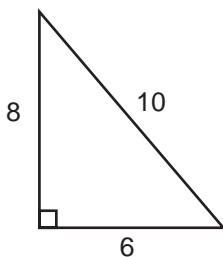
Solve each problem. Then record the letter that corresponds to the correct answer.

1. Which is the graph of the solution set of the inequality $-21 < 3t$?



2. Suppose a square has the same perimeter as the triangle below. How many units greater is the area of the square than the area of the triangle?

- (a) 6
(b) 10
(c) 12
(d) 18
(e) 20

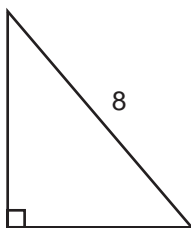


3. Which equation is a model of exponential decay?

- (a) $y = \frac{1}{5}(2^x)$
(b) $y = 100(0.7^x)$
(c) $y = 200(1.08^x)$
(d) $y = 3\left(\frac{10^x}{7}\right)$
(e) None of these

4. What is the area in square units of the isosceles right triangle below?

- (a) 2
(b) 8
(c) 16
(d) 32
(e) 64



Practice Set 8

5. For custom T-shirts, one company charges a \$25 art fee plus \$7 per T-shirt, another charges a \$50 art fee plus \$6.50 per T-shirt. For how many T-shirts would the total cost be the same from both companies?

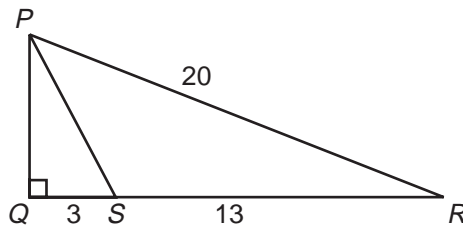
- (a) 12
- (b) 25
- (c) 50
- (d) 100
- (e) 375

6. If $\frac{1}{x} - y = 3$, then $x =$

- (a) $y + 3$
- (b) $y - 3$
- (c) $\frac{1}{y + 3}$
- (d) $y - \frac{1}{3}$
- (e) $1 + \frac{3}{y}$

7. What is the length of segment PS ?

- (a) 5
- (b) 12
- (c) $\sqrt{153}$
- (d) $\sqrt{222}$
- (e) $\sqrt{231}$



8. The perimeter of a rectangle is 12 yards. If its length is 4 yards, what is its width in yards?

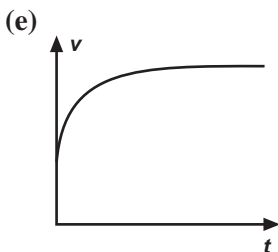
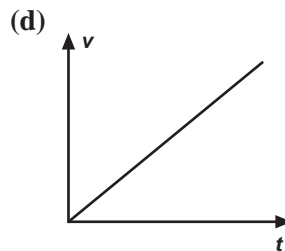
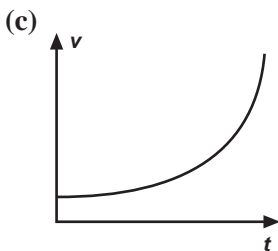
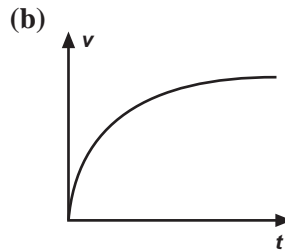
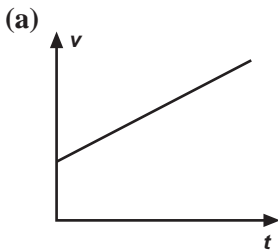
- (a) 2
- (b) 3
- (c) 4
- (d) 6
- (e) 8

Practice Set 8

9. Juan's scores on the first three of four 100-point tests were 72, 83, and 81. What is the lowest score he can earn on the fourth test to achieve an average of at least 80?

- (a) 59
- (b) 79
- (c) 80
- (d) 81
- (e) 84

10. Which graph best represents the value v over time t of a certificate of deposit earning 8% annual interest?



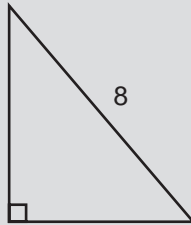
Practice Set 8

Test Taking Tip

Know the Pythagorean Theorem and how to use it.

The Pythagorean Theorem is one of the most widely used relationships in elementary mathematics. It should already appear on the list of facts to be memorized that you prepared at the end of Practice Set 5. If it is not on your list, add it now.

Example Look back at Item 4 on page 113. Since the triangle is an isosceles right triangle, the legs are equal in length. So, if x represents the length of each leg, then $x^2 + x^2 = 64$. So, $2x^2 = 64$, $x^2 = 32$, and $x = \sqrt{32}$.



The area of the triangle is $\frac{1}{2}(\sqrt{32})(\sqrt{32}) = \frac{1}{2}(32) = 16$ square units (Choice c).

- Look back at Practice Sets 1 through 8 and identify the items for which the Pythagorean Theorem was the key idea in solving the problems.
- Keep the Pythagorean Theorem in mind as you work on future practice sets.

Practice Set 9

Solve each problem. Then record the letter that corresponds to the correct answer.

- Jeremy transferred from a first period Earth Science class to a fourth period Earth Science class. Because of his transfer, the class test average was lowered in both classes. What must be true in order for this to occur?
 - Jeremy's test average was below both class averages.
 - Jeremy's test average was below the original class average and above the new class average.
 - Jeremy's test average was above the original class average and below the new class average.
 - Jeremy's test average was above both class averages.
 - This situation could not occur.
- Imagine that the strip pattern below extends indefinitely to the left and to the right.



Which type of symmetry is evident in this pattern?

- Translation
 - Reflection
 - Glide reflection
 - Rotation
 - No symmetry
- The midpoint of the segment whose endpoints have coordinates $(3, -2)$ and $(-6, 1)$ is:
 - $(4.5, -1.5)$
 - $(-1.5, -.5)$
 - $(-1.5, -1.5)$
 - $(-4.5, 1.5)$
 - $(-4.5, -1.5)$

Practice Set 9

4. The simplest form of $(-3xy^2)^2(x^2y)^3$ is

- (a) $-9x^{12}y^{12}$
- (b) $-9x^8y^7$
- (c) $9x^4y^{12}$
- (d) $-3x^4y^7$
- (e) $9x^8y^7$

5. A triangle has side lengths of 4, 10, and 12 units. What is the perimeter, in units, of a similar triangle with 30 units as the longest side?

- (a) 26
- (b) 44
- (c) 65
- (d) 70
- (e) 80

6. Which equation describes the relationship between x and y in the table below?

- (a) $y = 0.5^x$
- (b) $NEXT = 0.5NOW$
- (c) $y = 2^{-x}$
- (d) $y = \frac{1}{2^x}$
- (e) All of the above

| x | y |
|-----|------|
| -4 | 16 |
| -2 | 4 |
| 0 | 1 |
| 2 | 0.25 |

7. Find the solution to the following system of equations.

$$\begin{aligned}5x + 6y &= 18 \\ -5x + 7y &= 21\end{aligned}$$

- (a) (1, 3)
- (b) (0, 3)
- (c) (0, 0)
- (d) (1, 0)
- (e) No solution

Practice Set 9

8. Which of the following statements is **not** true?
- (a) If all the vertices of a graph are even, then the graph has an Euler circuit.
 - (b) If a graph has an Euler circuit, then all the vertices of the graph are even.
 - (c) If all the vertices of a graph are even, then the graph has an Euler path.
 - (d) If a graph has an Euler path, then all the vertices of the graph are even.
 - (e) All are true.
9. Assume a linear relationship. If a stand sells about 40 ice cream bars when the maximum daily temperature is 70°F and sells about 65 bars when the maximum daily temperature is 85°F , how many ice cream bars would you predict would be sold on a day with a maximum temperature of 100°F ?
- (a) 80
 - (b) 85
 - (c) 90
 - (d) 95
 - (e) 100
10. Arielle had \$240 at the start of the new year and has been steadily saving about \$25 each month. Her brother Shawn had \$320 at the start of the new year and has been steadily saving about \$20 each month. They have agreed to continue their savings plan together until Arielle has at least \$325.99—the price of the new stereo system she wants. At the current rate, how much will Shawn have saved when Arielle reaches her goal?
- (a) \$340
 - (b) \$360
 - (c) \$380
 - (d) \$400
 - (e) \$420

Practice Set 9

Test Taking Tip

Be careful in applying proportional reasoning to linear relationships.

Standardized tests often include items that can easily be solved using proportions. The key is to compare the same units in the same order.

Example Look back at Item 9 on page 119. Since a linear relationship is assumed, if n represents the number of ice cream bars predicted to be sold on a 100° day, then

$$\frac{65 - 40}{85 - 70} = \frac{n - 40}{100 - 70}. \text{ So, } \frac{n - 40}{30} = \frac{25}{15}, n - 40 = 50, \text{ or}$$

$n = 90$. The answer is (c).

Note that $\frac{40}{70} \neq \frac{65}{85}$. Be careful!

- Find another test item in this practice set which can be solved using proportional reasoning.
- Keep this caution in mind as you work on the next practice set and in your future work.

Practice Set 10

Solve each problem. Then record the letter that corresponds to the correct answer.

1. The table below shows summary statistics for the number of hours per week that several students spent on homework over a 10-week period.

Hours Spent on Homework

| | Mean | Median | Mode | Maximum | Minimum |
|------------------|-------------|---------------|-------------|----------------|----------------|
| Student A | 16 | 16 | 7 | 26 | 4 |
| Student B | 7 | 8 | 4 | 12 | 3 |
| Student C | 12 | 10 | 10 | 14 | 6 |
| Student D | 15 | 15 | 16 | 18 | 10 |
| Student E | 14 | 14 | 13 | 16 | 12 |

Which student was most consistent in the number of hours studying from week to week?

- (a) Student A
 - (b) Student B
 - (c) Student C
 - (d) Student D
 - (e) Student E
2. If each of the dimensions of a rectangular box are doubled, then how much more material will be required to construct the new box?
- (a) Twice as much
 - (b) Four times as much
 - (c) Six times as much
 - (d) Eight times as much
 - (e) It depends on the original dimensions of the box.
3. Which is an equivalent form of $8a^2b(3a + 2ab^3)$?
- (a) $24a^2b + 16a^2b^3$
 - (b) $11a^3b + 2ab^3$
 - (c) $24a^3b + 2ab^3$
 - (d) $24a^3b + 16a^3b^4$
 - (e) $11a^2b + 10a^2b^3$

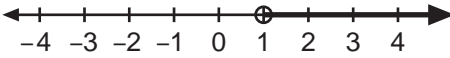
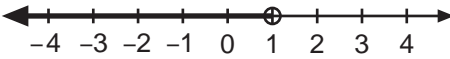
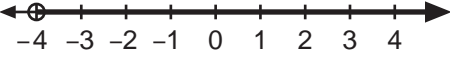
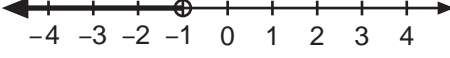
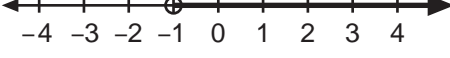
Practice Set 10

4. Which equation describes the relationship between x and y in the table below?

- (a) $y = 8x - 2$
- (b) $NEXT = NOW + 4$
- (c) $y = 8x - 6$
- (d) $NEXT = 4NOW - 2$
- (e) None of the above

| x | y |
|-----|-----|
| -3 | -14 |
| -1 | -6 |
| 1 | 2 |
| 3 | 10 |

5. Which graph below represents the solution of the inequality $5 - 2x < 3$?

- (a) 
- (b) 
- (c) 
- (d) 
- (e) 

6. Which expression represents the measure in degrees of the third angle in the triangle below?

- (a) $176 - 13x$
- (b) $13x - 4$
- (c) $184 - 13x$
- (d) $13x - 176$
- (e) $176 - 7x$



7. If x , y , and z are consecutive integers and $x > y > z$, then $(x - y)(x - z)(y - z) =$

- (a) -4
- (b) -2
- (c) 1
- (d) 2
- (e) 4

Practice Set 10

8. If 2 less than 3 times a certain number is the same as 4 more than the product of 6 and 3, what is the number?

(a) $-\frac{20}{3}$

(b) $\frac{20}{3}$

(c) $\frac{22}{3}$

(d) 8

(e) 10

9. What are the coordinates of the point of intersection of the lines with equations $x - 2y = 6$ and $3x + y = 4$?

(a) (2, -2)

(b) (2, 2)

(c) (-2, 2)

(d) (-2, -2)

(e) None of the above

10. What is the length of arc AB in the diagram below?

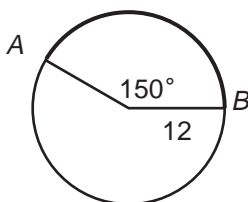
(a) 10

(b) 24

(c) 10π

(d) 24π

(e) 60π



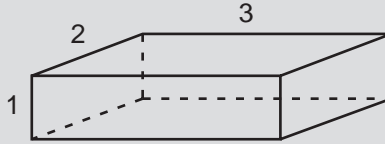
Practice Set 10

Test Taking Tip

For general problem situations, create and analyze a specific example.

When you create a specific example for a general problem situation, you can test the given choices against your example.

Example Look back at Item 2 on page 121. To use this strategy, consider a rectangular box with the indicated dimensions.



The surface area of this box is $2(2) + 2(6) + 2(3) = 22$ square units.

If the dimensions are doubled, the box is $2 \times 4 \times 6$. The surface area is $2(8) + 2(24) + 2(12) = 88$ square units.

The surface area of the new box is four times as great. The correct choice is (b).

- Find, if possible, another test item in this practice set for which the strategy might be helpful. Try it.
- Keep this strategy in mind as you work on future problems of this type.

Solutions to Practice Sets for Standardized Tests

Practice Set 1, pp. 86–88

1. (b)
2. (b)
3. (a)
4. (b)
5. (c)
6. (d)
7. (c)
8. (b)
9. (a)
10. (e)

Practice Set 3, pp. 93–96

1. (c)
2. (e)
3. (b)
4. (b)
5. (c)
6. (c)
7. (e)
8. (d)
9. (b)
10. (b)

Practice Set 2, pp. 89–92

1. (c)
2. (b)
3. (c)
4. (a)
5. (a)
6. (c)
7. (d)
8. (c)
9. (c)
10. (e)

Practice Set 4, pp. 97–100

1. (d)
2. (a)
3. (c)
4. (d)
5. (d)
6. (e)
7. (a)
8. (b)
9. (d)
10. (c)

Practice Set 5, pp. 101–104

1. (d)
2. (d)
3. (d)
4. (b)
5. (c)
6. (c)
7. (a)
8. (d)
9. (e)
10. (b)

Practice Set 7, pp. 109–112

1. (b)
2. (c)
3. (b)
4. (d)
5. (e)
6. (e)
7. (c)
8. (c)
9. (e)
10. (b)

Practice Set 6, pp. 105–108

1. (d)
2. (d)
3. (c)
4. (a)
5. (c)
6. (b)
7. (d)
8. (a)
9. (b)
10. (c)

Practice Set 8, pp. 113–116

1. (e)
2. (c)
3. (b)
4. (c)
5. (c)
6. (c)
7. (c)
8. (a)
9. (e)
10. (c)

Practice Set 9, pp. 117–120

- 1. (c)**
- 2. (a)**
- 3. (b)**
- 4. (e)**
- 5. (c)**
- 6. (e)**
- 7. (b)**
- 8. (d)**
- 9. (c)**
- 10. (d)**

Practice Set 10, pp. 121–124

- 1. (e)**
- 2. (b)**
- 3. (d)**
- 4. (d)**
- 5. (a)**
- 6. (c)**
- 7. (d)**
- 8. (d)**
- 9. (a)**
- 10. (c)**