

**Exit Level Math
Review**

**Answers to Practice
Problems**

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The Texas Assessment of Knowledge and Skills (TAKS) exit level exam covers ten learning objectives. These lessons are designed to teach math concepts specific to each objective as well as strategies to consider when approaching typical TAKS questions. To successfully complete the TAKS exit level exam, the student should be able to:

- 1) Describe functional relationships in a variety of ways;
- 2) Demonstrate an understanding of the properties and attributes of functions;
- 3) Demonstrate an understanding of linear functions;
- 4) Formulate and use linear equations and inequalities;
- 5) Demonstrate an understanding of quadratic equations and other nonlinear functions;
- 6) Demonstrate an understanding of geometric relationships and spatial reasoning;
- 7) Demonstrate an understanding of two- and three-dimensional representations of geometric relationships and shapes;
- 8) Demonstrate an understanding of concepts and uses of measurement and similarity;
- 9) Demonstrate an understanding of percents, proportional relationships, probability, and statistics in application problems;
- 10) Demonstrate an understanding of the mathematical processes and tools used in problem solving.

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Answers to Practice Problems – Lesson 1

1) B

2) B

3) D

4) D



Answers to Practice Problems – Lesson 2

1) Independent quantity: x
 Dependent quantity: y
 Constants: $-1, 3$

2) Independent quantity: x
 Dependent quantity: $f(x)$
 Constants: $2, 5, -7$

3) Independent quantity: p
 Dependent quantity: m
 Constant: 5

4) Independent quantity: n
 Dependent quantity: $p(n)$
 Constants: $2, 6$

5) B



Answers to Practice Problems – Lesson 3

1) A

2) C

3) B

4) D



Answers to Practice Problems – Lesson 4

1) B

2) C

3) C

4) Domain = $\{-6, -4, 0, 3\}$
 Range = $\{0, 1, -8\}$

5) Domain = $\{0, 1, 3, 5\}$
 Range = $\{0, 1, 3\}$

6) Domain = $\{1, 4, 7, 9\}$
 Range = $\{3, 7, 8\}$

7) A

8) C

9) A



Answers to Practice Problems – Lesson 5

1) C

2) C

3) C



Answers to Practice Problems – Lesson 6

$$\begin{aligned}
 1) \text{ B} \quad & 4n(3 - n) - 2(n^2 - 3n) \\
 & = 12n - 4n^2 - 2n^2 + 6n \\
 & = -6n^2 + 18n
 \end{aligned}$$

$$\begin{aligned}
 2) \text{ A} \quad & m + 11 + 12 + m + 2m - 1 \\
 & = 4m + 22
 \end{aligned}$$

$$\begin{aligned}
 3) \text{ C} \quad & (x - y)(x - y) \\
 & = x^2 - xy - xy + y^2 \\
 & = x^2 - 2xy + y^2
 \end{aligned}$$

$$\begin{aligned}
 4) \text{ D} \quad & 4(x + 2) - (x + 3) = 17 \\
 & 4x + 8 - x - 3 = 17 \\
 & 3x + 5 = 17 \\
 & 3x = 12 \\
 & x = 4
 \end{aligned}$$

$$\begin{aligned}
 5) \text{ B} \quad & 3(10 - 2x) = 24 \\
 & 30 - 6x = 24 \\
 & -6x = -6 \\
 & x = 1
 \end{aligned}$$

$$\begin{aligned}
 6) \text{ D} \quad & 2y - 3x = 5x + 10 \\
 & \quad \quad +3x \quad +3x \\
 & 2y = 8x + 10 \\
 & y = 4x + 5
 \end{aligned}$$



Answers to Practice Problems – Lesson 7

1) $x + 20$

2) $3x$

3) $9 - x$

4) $(x + 3)(2)$

5) $\frac{2}{3}x - 2$

6) $8x = 64$

7) $2x - 15 = 5$

8) **B**9) **B**10) **C**11) **C**

Answers to Practice Problems – Lesson 8

1) slope = $-\frac{1}{7}$

y-intercept = 7

2) slope = $\frac{3}{2}$

y-intercept = 2

3) slope = $-\frac{1}{2}$

y-intercept = -6

4) slope = 0

y-intercept = -8.5

5) $m = \frac{y_2 - y_1}{x_2 - x_1}$

$m = \frac{6 - 3}{2 - 1}$

$m = \frac{3}{1}$

$m = 3$

6) **B**

7) $m = 2$

8) 14

9) -45



Answers to Practice Problems – Lesson 9

1) C

2) B

3) A

$$4) \quad m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-8 - -6}{5 - 4} = \frac{-2}{1} = -2$$

$$y = mx + b$$

$$-6 = -2(4) + b$$

$$-6 = -8 + b$$

$$2 = b$$

The answer is choice **A**.

5) B



Answers to Practice Problems – Lesson 10

1) B

2) C

$$3) \quad 3y = 2x - 1 \Rightarrow y = \frac{2}{3}x - \frac{1}{3}$$

Choice D:

$$9y - 6x = 0$$

$$9y = 6x$$

$$y = \frac{6}{9}x$$

$$y = \frac{2}{3}x$$

The answer is choice **D**.

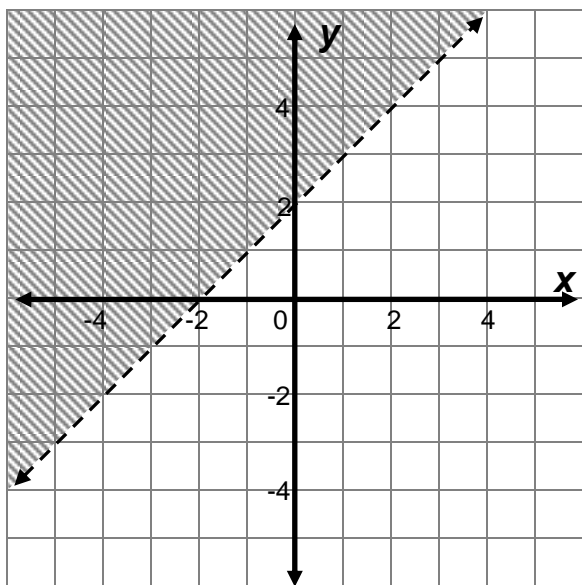
4) **A**

5) Choice **C** is the answer. This can be found by determining that the slope of a line perpendicular to $2x - y = -x + 2$ is $m = -\frac{1}{3}$. Choice **C** is the only choice with a slope equal to $-\frac{1}{3}$.



Answers to Practice Problems – Lesson 11

1)

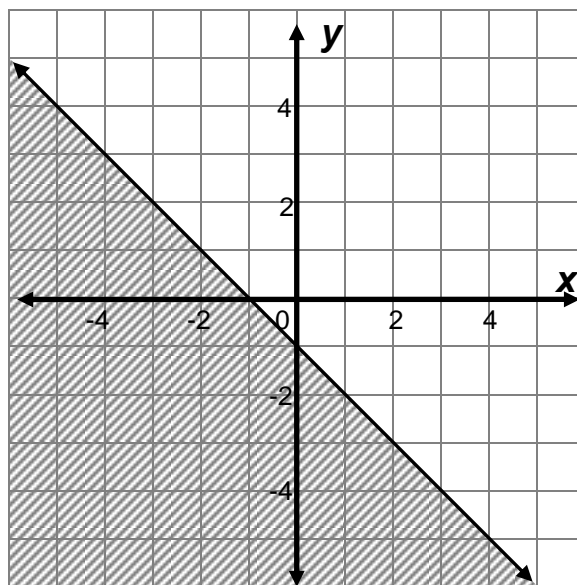
2) $2x + 2y \leq -2$

$$\begin{array}{r} -2x \\ -2x \end{array}$$

$$2y \leq -2x - 2$$

$$\frac{2y}{2} \leq \frac{-2x - 2}{2}$$

$$y \leq -x - 1$$

3) **C**

TAKS Review

- 4) An average of 2 mattresses per hour translates to an average of 80 mattresses per 40 hour work week.

$$\$6 \times 40 \text{ hr.} = \$240 \text{ pay without tip}$$

$$\$612 \text{ total pay} - \$240 \text{ pay before tip} = \$372 \text{ total tip money}$$

$$\$372 \text{ total tip money} \div 80 \text{ mattresses} = \$4.65 \text{ tip per mattress.}$$

The answer is choice **B**.



Answers to Practice Problems – Lesson 12

1) **C**

2) **A**

3) **A**

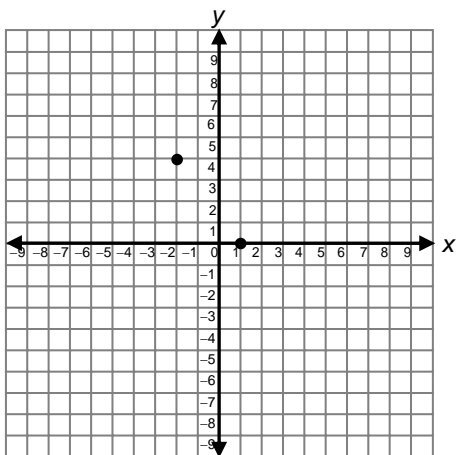
4) **D** In $y = mx + b$ these equations are identical, so there infinitely many solutions.

5) **B**



Answers to Practice Problems – Lesson 13

- 1) Plot the given points on the graph.



Since this is a parabola, and we are given the vertex and a root, we can find the second root by using the fact that the graph must be symmetrical. The distance from the given root and the axis of symmetry is 3 units. If we match this distance, we find the second root falls on the point $(-5, 0)$, given by choice **C**.

2) **B**

3) **C**



Answers to Practice Problems – Lesson 14

Note: Factors may be written in any order. For instance, the answer to question two can be given as $(x - 5)(x + 4)$ or as $(x + 4)(x - 5)$.

1) B

2) $(x - 5)(x + 4)$

3) $4x^2 + 4x - 24$

4) $x^2 - y^2 = (x + y)(x - y)$

$$= 4(x^2 + x - 6)$$

$$= 4(x + 3)(x - 2)$$

5)

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(-11) \pm \sqrt{(-11)^2 - 4(6)(10)}}{2(6)}$$

$$x = \frac{11 \pm \sqrt{121 - 240}}{12}$$

The number under the radical will be negative. Therefore there are no real solutions. **D**

6) $2x^2 + 3x + 8 = 3x - 10$

$$2x^2 + 18 = 0$$

$$2(x^2 + 9) = 0$$

$$x^2 + 9 = 0$$

The answer is choice **D**.



Answers to Practice Problems – Lesson 15

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$1) \quad x = \frac{-1 \pm \sqrt{1^2 - 4(4)(2)}}{2(4)} = \frac{-1 \pm \sqrt{1 - 32}}{8} = \frac{-1 \pm \sqrt{-31}}{8} \quad \text{No real solutions}$$

$$2) \quad x = \frac{-2 \pm \sqrt{2^2 - 4(1)(9)}}{2(1)} = \frac{-2 \pm \sqrt{4 - 36}}{2} = \frac{-2 \pm \sqrt{-32}}{8} \quad \text{No real solutions}$$

3) C

4) A

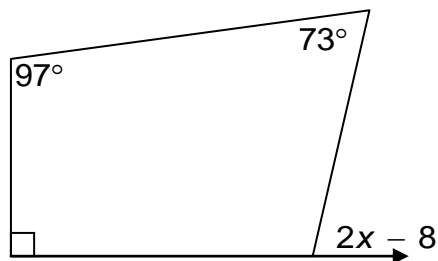
5) B



Answers to Practice Problems – Lesson 16

1) B

The sum of the interior angles shown is
 $90 + 97 + 73 = 260$. The missing interior angle is
 $360 - 260 = 100$. Therefore, the exterior angle is
 80° .



2) A Vertical angles are equal. Set the expressions equal to each other and solve for x .

3) D $\angle OAP$ is a right angle, because the intersection of a radius and a tangent are perpendicular. Since the angle sum in a triangle is 180° we can find angle P .

$$180 - (90 + 67) = \angle P$$

4) A Subtract the area of the triangle from the area of the rectangle.

$$bh - \frac{1}{2}bh = \left(1 - \frac{1}{2}\right)bh = \frac{1}{2}bh$$

5) 4096 The number of squares is multiplied by 8 in each stage.



Answers to Practice Problems – Lesson 17

1) B

2) D

3) B

4) B

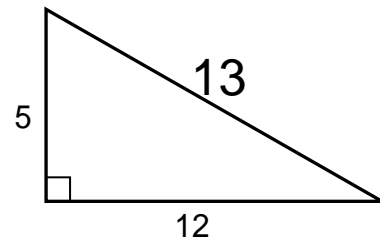


Answers to Practice Problems – Lesson 18

1) B The triangle formed with the height and base is a 30-60-90 triangle. The side opposite the 30° angle is .5, and the height is opposite the 60° angle, so it is $.5\sqrt{3} \approx .9$

2) $8^2 + 15^2 = 17^2$
 $64 + 225 = 289$
 $289 = 289$

3)



4) A

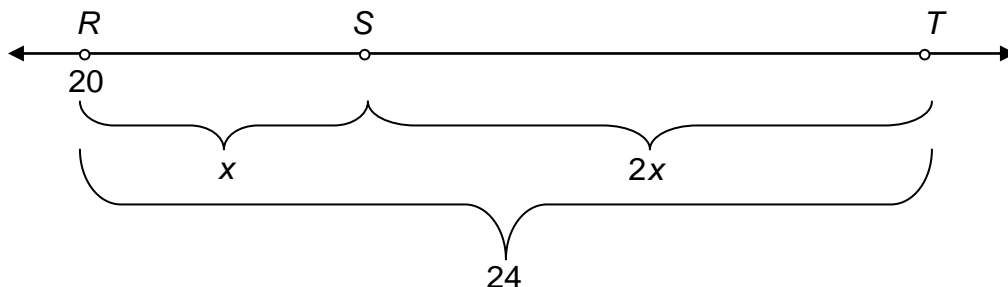
5) D

6) B $\frac{227}{\sqrt{3}} \approx 131$



Answers to Practice Problems – Lesson 19

- 1) **B** Draw a number line to help visualize this.



Let x = the distance between R and S . Since $ST = 2RS$, $ST = 2x$.

We know that $RS + ST = RT$, so $x + 2x = 24$.

$$x + 2x = 24$$

$$3x = 24$$

$$x = 8$$

Since R was at 20, S is 8 more than that.

$$20 + x = 20 + 8 = 28$$

- 2) **B** The midpoints of \overline{XY} and \overline{YZ} are $(0,16)$ and $(7,22.5)$ respectively. The distance between these points is found using the distance formula

$$\sqrt{(7 - 0)^2 + (22.5 - 16)^2} = \sqrt{(7)^2 + (6.5)^2} = \sqrt{91.25} \approx 9.55$$

$$9.55 \approx 9.6$$

- 3) **A** Find the length of the diameter and divide by 2.

$$\sqrt{(-6 - -2)^2 + (2 - 4)^2} = \sqrt{(-4)^2 + (-2)^2} = \sqrt{20} \approx 4.47$$

$$\frac{4.47}{2} \approx 2.24$$

You could also find the distance between the midpoint and either of the endpoints

- 4) **D**

- 5) **D** Find the length of the radius and double it.

$$\sqrt{(-2 - 4)^2 + (4 - 3)^2} = \sqrt{(-6)^2 + (1)^2} = \sqrt{37} \approx 6.1$$

$$6.1 \times 2 = 12.2$$



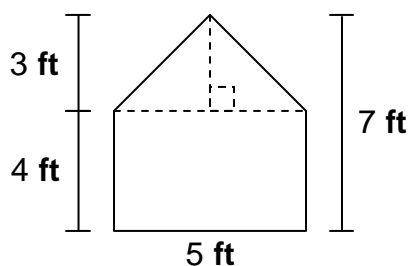
Answers to Practice Problems – Lesson 20

- 1) **A** 2) **A** 3) **C** 4) **B** 5) **B**



Answers to Practice Problems – Lesson 21

- 1) **D** 2) **D** 3) **B**
 4) **A** The solid is a pentagonal prism. The base is a pentagon that is comprised of a rectangle and a triangle.

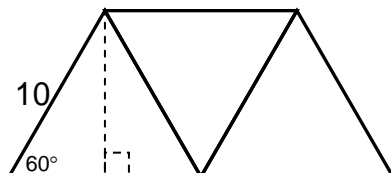


The rectangle is 20 square feet and the triangle is 7.5 square feet. The area of the base is 27.5 square feet. Then, multiply the base and the height, which is 9 feet.



Answers to Practice Problems – Lesson 22

- 1) **D** Since each of the triangles is equilateral the interior angles of all of them are 60° .



When we draw in the height of the triangle, it forms a 30-60-90 triangle. Since 10 is the hypotenuse of the triangle, 5 is one of the legs, and $5\sqrt{3}$ is the side opposite the 60° angle. $5\sqrt{3}$ represents the height of each equilateral triangle.

The area of each triangle is, therefore, $\frac{1}{2}(10)(5\sqrt{3}) \approx 43.3$. There are three triangles, so the total area is $3 \times 43.3 \approx 130$ units².

Note: There are many ways to solve this problem.

- 2) **B** Each side is 15 m, and the diagonal forms a 45-45-90 triangle.

- 3) **B** The length of the diameter is found using the distance formula.

$$\sqrt{(-3.5 - 4.5)^2 + (1 - 2.3)^2} = \sqrt{(-8)^2 + (-1.3)^2} = \sqrt{65.69} \approx 8.1$$

The radius is half the diameter, so the radius is approximately 4 units.

- 4) **24.96** $\frac{1}{2}aP = \frac{1}{2}(3)(2.08 \times 8) = \frac{1}{2}(3)(16.64) = 24.96$



Answers to Practice Problems – Lesson 23

- 1) **A** Use the following proportion to find x . $\frac{2}{5} = \frac{x}{7}$
- 2) **B** $\triangle ABC$ and $\triangle DAC$ are similar triangles. Use the following proportion to find segment AD . $\frac{4}{5} = \frac{x}{3}$
- 3) **D** Find the area of the larger sector of the circle (12.65 square units) and subtract the area of the smaller sector (4.9 square units).
- 4) **D**



Answers to Practice Problems – Lesson 24

- 1) **C** 2) **D**



Answers to Practice Problems – Lesson 25

- 1) **B** 2) **D**

TAKS Review

3) **D** It takes $2\frac{2}{3}$ hours to make the trip. $\frac{2}{3}$ of an hour is 40 minutes.

4) **B**



Answers to Practice Problems – Lesson 26

1) $\frac{1}{6}$

2) $\frac{3}{7}$

3) $\frac{1}{8}$

4) $\frac{6}{12} = \frac{1}{2}$

5) $\frac{4}{49}$

6) $\frac{8}{110} = \frac{4}{55}$

7) $\frac{10}{20} \times \frac{9}{19} \times \frac{8}{18} = \frac{1}{2} \times \frac{9}{19} \times \frac{4}{9} = \frac{36}{342} = \frac{2}{19}$

8) $\frac{1}{6}$

9) **D**

10) **B**

11) **C** The theoretical probability of a 3 or a 7 is $\frac{1}{3}$. The experimental probability is

$$\frac{22}{60}. \text{ The difference is } \frac{22}{60} - \frac{1}{3} = \frac{22}{60} - \frac{20}{60} = \frac{2}{60} = \frac{1}{30}.$$



Answers to Practice Problems – Lesson 27

1) **Mean: 87.2****Median: 89.5****Mode: 98****Range: 46**2) **C**3) **C**

- 4) **B** The average of Lisa's test score is an 86. This counts as 60% of her total grade. The project is the other 40%. We need to solve the following equation to find the grade she needs.

$$\begin{aligned} .4x + .6(86) &= 87 \\ .4x + 51.6 &= 87 \\ \underline{-51.6} \quad \underline{-51.6} & \\ \underline{.4x} &= \underline{35.4} \\ \underline{.4} & \quad \underline{.4} \\ x &= 88.5 \approx 89 \end{aligned}$$



Answers to Practice Problems – Lesson 28

1) **C**2) **D**



Answers to Practice Problems – Lesson 29

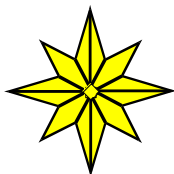
- 1) **B** Choices **A** and **C** seem unreasonably high. To solve this, we would need to solve the following equation.

$$x + .2x = 30$$

↙
↑
↘

The original number of cookies 20% more of the cookies The total number of cookies

- 2) **C** If Darla makes 20 pots she makes \$400. This will not cover her overhead cost, so choice **A** is not the answer. If she makes 30 pots, she earns \$600, but this only covers the overhead not the materials. Choice **B** is not the answer. If she earns \$20 for each pot sold and pays \$5 for each pot, she has a net gain of \$15 on each pot sold. If she sells 40 pots with a net gain of \$15, she earns \$600 which covers her overhead cost.
- 3) **B** The horizontal distance is the other leg of the right triangle drawn. The other leg has to be bigger than 3000 feet, so choice **A** does not work. This is a 30-60-90 triangle, and the side opposite the 30° angle is 3000 feet. The hypotenuse is 6000 feet, so this rules out choices **C** and **D**.
- 4) **D** The 5-foot rod should weigh more than the 2-foot rod, so choice **A** does not work. Also, the 5-foot rod is more than twice the length of the 2-foot rod, so the 5-foot rod should be more than twice the weight of the 2-foot rod. Thus, choices **B** and **C** do not work.



End of Answers to Practice Problems

