## Name:

## **Algebra I Regents Bimodal Worksheets**

1 The dot plots below represent test scores for 20 students on a math test.



The mode for this math test is 80 and the median is 85. Which dot plot correctly represents this data?

2 A function is graphed on the set of axes below.



The domain of this function is

3 What is the sum of  $8\sqrt{3}$  and  $\sqrt{3}$ ?

4 The solution to 
$$\frac{4(x-5)}{3} + 2 = 14$$
 is

- 5 The number of fish in a pond is eight more than the number of frogs. The total number of fish and frogs in the pond is at least 20. If *x* represents the number of frogs, which inequality can be used to represent this situation?
- 6 When solved for x in terms of a, the solution to the equation 3x 7 = ax + 5 is

Algebra I Regents Bimodal Worksheet # 2 www.jmap.org

7 The table below shows the highest temperatures recorded in August for several years in one town.

Year	<b>Temperature</b> (°F)
1990	86
1991	78
1992	84
1993	95
1994	81
1995	77
1996	88
1997	93

The interquartile range of these data is

8 Market Street Pizza kept a record of pizza sales for the month of February. The results are shown in the table below.

Туре	Plain	Veggie	Meat Only	The Works
Thin Crust	300	80	120	100
Deep-dish	200	25	105	70

Of all the pizzas sold in February, what percent were plain, deep-dish pizzas?

- 9 The equation that represents the sequence  $-2, -5, -8, -11, -14, \dots$  is
- 10 A tour bus can seat, at most, 48 passengers. An adult ticket costs \$18 and a child ticket costs \$12. The bus company must collect at least \$650 to make a profit. If *a* represents the number of adult tickets sold and *c* represents the number of child tickets sold, which system of inequalities models this situation if they make a profit?
- 11 What is the *y*-intercept of the line that passes through the points (-1,5) and (2,-1)?
- 12 What is the solution to the inequality  $2m-4 \le 3(2m+4)$ ?
- 13 The function  $f(x) = x^2$  is multiplied by *k*, where k < -1. Which graph could represent g(x) = kf(x)?

## Algebra I Regents Bimodal Worksheet # 3 www.jmap.org

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- 14 A survey of students at West High School was taken to determine a theme for the prom. The results of the survey are summarized in the table below.

	Beach Party	Hollywood	Broadway
Girls	86	112	68
Boys	123	77	79

Approximately what percentage of the students who chose the Broadway theme were girls?

15 One Saturday, Dave took a long bike ride. The graph below models his trip.



What was Dave's average rate of change, in miles per hour, on this trip?

- 16 In an arithmetic sequence, the first term is 25 and the third term is 15. What is the tenth term in this sequence?
- 17 When the formula p = 2l + 2w is solved for w, the result is

- 18 Elena's fastest time for the 50-meter dash is 7 seconds. She wants to know how fast this is in inches per minute. Which expression can Elena use for a correct conversion?
- 19 Stephanie is solving the equation  $x^2 12 = 7x 8$ . Her first step is shown below.

Given:  $x^2 - 12 = 7x - 8$ Step 1:  $x^2 - 4 = 7x$ Which property justifies her first step?

20 A geometric sequence is shown below.

 $\frac{1}{2}$ ,2,8,32,...

What is the common ratio?

- 21 The zeros of the function f(x) = x(x-5)(3x+6) are
- 22 What is the sum of  $3x\sqrt{7}$  and  $2x\sqrt{7}$ ?

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- 23 When the equation 6 ax = ax 2 is solved for x in terms of a, and  $a \neq 0$ , the result is
- 24 If  $f(x) = x^2$ , then which function represents a shift of the graph of f(x) 4 units to the right and 3 units down?
- 25 When babysitting, Nicole charges an hourly rate and an additional charge for gas. She uses the function C(h) = 6h + 5 to determine how much to charge for babysitting. The constant term of this function represents
- 26 The expression  $-2(x^2 2x + 1) + (3x^2 + 3x 5)$  is equivalent to
- 27 When solving the equation  $4x^2 16 = 0$ , Laura wrote  $4x^2 = 16$  as her first step. Which property justifies Laura's first step?
- 28 Wayde van Niekerk, a runner from South Africa, ran 400 meters in 43.03 seconds to set a world record. Which calculation would determine his average speed, in miles per hour?
- 29 If  $x = 4a^2 a + 3$  and y = a 5, then which polynomial is equivalent to the product of x and y?

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- 30 When solving  $-2(3x-5) = \frac{9}{2}x 2$  for x, the solution is
- 31 Which expression is equivalent to  $3(x^2 2x + 3) (4x^2 + 3x 1)?$
- 32 What is the constant term of the polynomial  $2x^3 x + 5 + 4x^2$ ?
- 33 Which equation represents the line that passes through the points (-1, 8) and (4, -2)?
- 34 What is an equation of the line that passes through (3,7) and has a slope of 2?
- 35 The students in Mrs. Smith's algebra class were asked to describe the graph of  $g(x) = 2(x-3)^2$ compared to the graph of  $f(x) = x^2$ . Which student response is correct?
- 36 Joe is ordering water for his swimming pool. He determines the volume of his pool to be about 3240 cubic feet. There are approximately 7.5 gallons of water in 1 cubic foot. A truck load holds 6000 gallons of water. Which expression would allow Joe to correctly calculate the number of truck loads of water he needs to fill his pool?

37 The inputs and outputs of a function are shown in the table below.

X	f(x)
0	0.0625
1	0.125
2	0.25
3	0.5
4	1
5	2

This function can best be described as

38 The functions f(x) and g(x) are graphed on the set of axes below.



What is the solution to the equation f(x) = g(x)?

39 At Adelynn's first birthday party, each guest brought \$1 in coins for her piggy bank. Guests brought nickels, dimes, and quarters for a total of \$28. There were twice as many dimes as nickels and 12 more quarters than nickels. Which equation could be used to determine the number of nickels, *x*, that her guests brought to her party?

- 40 The amount of money a plumber charges is represented by the function p(h) = 45 + 90h. The best interpretation of the *y*-intercept of this function is that the plumber charges
- 41 Which expression is equivalent to  $(5x^2 2x + 4) (3x^2 + 3x 1)?$
- 42 Which graph is the solution to the inequality  $6.4 4x \ge -2.8$ ?
- 43 The sum of  $2\sqrt{54}$  and  $2\sqrt{6}$  is
- 44 On an island, a rare breed of rabbit doubled its population each month for two years. Which type of function best models the increase in population at the end of two years?

<b>Books Sold</b>	Profit
100	\$50.00
250	\$275.00
300	\$350.00
350	\$425.00

45 A bookstore owner recorded the number of books sold and the profit made selling the books.

- What is the average rate of change, in dollars per book, between 100 and 350 books sold?
- 46 A landscaping company charges a set fee for a spring cleanup, plus an hourly labor rate. The total cost is modeled by the function C(x) = 55x + 80. In this function, what does the 55 represent?
- 47 Nancy has just been hired for her first job. Her company gives her four choices for how she can collect her annual salary over the first eight years of employment. Each function below represents the four choices she has for her annual salary in thousands of dollars, where *t* represents the number of years after she is hired.

$$a(t) = 2^{t} + 25$$
  

$$b(t) = 10t + 75$$
  

$$c(t) = \sqrt{400t} + 80$$
  

$$d(t) = 2(t+1)^{2} - 10t + 50$$

Which pay plan should Nancy choose in order to have the highest salary in her eighth year?

48 The functions  $f(x) = x^2 - 5x - 14$  and g(x) = x + 2are graphed on the same set of axes. What are the solutions to the equation f(x) = g(x)?

- 49 Which graph below represents a function that is always *decreasing* over the entire interval -3 < x < 3?
- 50 The third term in a sequence is 25 and the fifth term is 625. Which number could be the common ratio of the sequence?
- 51 What is the degree of the polynomial  $2x x^2 + 4x^3$ ?
- 52 The box plot below summarizes the data for the amount of snowfall, in inches, during the winter of 2021 for 12 locations in western New York.



What is the interquartile range?

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- 53 In an arithmetic sequence, the first term is 4 and the third term is -2. What is the common difference?
- 54 What is an equation of the line that passes through the points (2,7) and (-1,3)?
- 55 Which function has the zeros -1, 3, and -4?

## Algebra I Regents Bimodal Worksheets Answer Section

1 ANS: Ι PTS: 2 REF: 012516ai TOP: Dot Plots 2 ANS:  ${x | x > -2}$ PTS: 2 REF: 012517ai TOP: Domain and Range KEY: graph 3 ANS:  $9\sqrt{3}$ PTS: 2 REF: 012515ai TOP: Operations with Radicals KEY: addition 4 ANS: 14  $\frac{4(x-5)}{3} = 12$ 4x - 20 = 364x = 56*x* = 14 PTS: 2 REF: 062406ai TOP: Solving Linear Equations 5 ANS:  $2x + 8 \ge 20$  $x + x + 8 \ge 20$ PTS: 2 REF: 012523ai TOP: Modeling Linear Inequalities 6 ANS:  $\frac{12}{3-a}$ 3x - ax = 12x(3-a) = 12 $x = \frac{12}{3-a}$ 

PTS: 2 REF: 062422ai TOP: Solving Linear Equations KEY: coefficients represented by letters

7 ANS: 11 77 78 81 84 86 88 93 95 79.5 90.5 90.5-79.5=11 PTS: 2 REF: 012520ai TOP: Dispersion KEY: basic 8 ANS: 20%  $\frac{200}{300 + 200 + 80 + 25 + 120 + 105 + 100 + 70} = \frac{200}{1000} = 20\%$ PTS: 2 REF: 012510ai **TOP:** Frequency Tables KEY: two-way 9 ANS:  $a_n = -2 + (-3)(n-1)$ PTS: 2 REF: 062415ai TOP: Sequences KEY: explicit 10 ANS:  $a + c \leq 48$  $18a + 12c \ge 650$ PTS: 2 REF: 062402ai TOP: Modeling Systems of Linear Inequalities 11 ANS: 3  $\frac{5--1}{-1-2} = \frac{6}{-3} = -2 \ 5 = -2(-1) + b$ 3 = bPTS: 2 REF: 062410ai **TOP:** Graphing Linear Functions 12 ANS:  $m \ge -4$  $2m-4 \le 3(2m+4)$  $2m-4 \le 6m+12$  $-16 \leq 4m$  $-4 \le m$ PTS: 2 REF: 082413ai **TOP:** Solving Linear Inequalities

13 ANS:



14	PTS: 2 KEY: bimodalgraph ANS: 46 $\frac{68}{68+79} \approx 0.46$	REF:	012521ai	TOP:	Transformations with Functions
15	PTS: 2 KEY: two-way ANS: 10 $\frac{55-0}{5.5-0} = 10$	REF:	082414ai	TOP:	Frequency Tables
16	PTS: 2 ANS: -20 $\frac{15-25}{3-1} = \frac{-10}{2} = -5$	REF: $a_{10} = 2$	062418ai 5 + (10 - 1)(-5)	TOP: ) = 25 -	Rate of Change $-45 = -20$
17	PTS: 2 ANS: $w = \frac{p-2l}{2}$ $p = 2l + 2w$ $p - 2l = 2w$ $\frac{p-2l}{2} = w$	REF:	012508ai	TOP:	Sequences KEY: explicit
18	PTS: 2 ANS: $\frac{50 \text{ meters}}{7 \text{ sec}} \bullet \frac{60 \text{ sec}}{1 \text{ min}} \bullet$	REF: <u>39.37 in</u> 1 mete	012509ai <u>n</u> r	TOP:	Transforming Formulas
	PTS: 2	REF:	012519ai	TOP:	Conversions

19 ANS:

addition property of equality

PTS: 2 **TOP:** Identifying Properties REF: 012514ai 20 ANS: 4  $\frac{8}{2} = 4$ PTS: 2 REF: 012503ai TOP: Sequences KEY: difference or ratio 21 ANS: 0, 5, and -2 PTS: 2 REF: 062409ai TOP: Zeros of Polynomials 22 ANS:  $5x\sqrt{7}$ PTS: 2 REF: fall2301ai TOP: Operations with Radicals KEY: addition 23 ANS:  $\frac{4}{a}$ 6 - ax = ax - 28 = 2ax $\frac{8}{2a} = x$  $\frac{4}{a} = x$ PTS: 2 REF: 082420ai **TOP:** Solving Linear Equations KEY: coefficients represented by letters 24 ANS:  $h(x) = (x-4)^2 - 3$ PTS: 2 **TOP:** Transformations with Functions REF: 082411ai 25 ANS: the additional charge for gas PTS: 2 REF: 062421ai TOP: Modeling Linear Functions 26 ANS:  $x^{2} + 7x - 7$  $-2x^{2} + 4x - 2 + 3x^{2} + 3x - 5 = x^{2} + 7x - 7$ PTS: 2 TOP: Operations with Polynomials REF: 062404ai KEY: addition

27 ANS: addition property of equality PTS: 2 REF: 082406ai **TOP:** Identifying Properties 28 ANS: 400 m 0.62 mi 3600 sec  $\overline{43.03 \text{ sec}}$  :  $\overline{1000 \text{ m}}$ 1 hr PTS: 2 REF: 062423ai **TOP:** Conversions 29 ANS:  $4a^3 - 21a^2 + 8a - 15$ (4a<sup>2</sup> - a + 3)(a - 5) = 4a<sup>3</sup> - 20a<sup>2</sup> - a<sup>2</sup> + 5a + 3a - 15 = 4a<sup>3</sup> - 21a<sup>2</sup> + 8a - 15TOP: Operations with Polynomials PTS: 2 REF: 082417ai **KEY:** multiplication 30 ANS:  $\frac{8}{7}$  $-2(3x-5) = \frac{9}{2}x - 2$ -4(3x-5) = 9x - 4-12x + 20 = 9x - 424 = 21x $x = \frac{24}{21} = \frac{8}{7}$ PTS: 2 REF: 012511ai **TOP:** Solving Linear Equations 31 ANS:  $-x^2 - 9x + 10$  $3(x^2 - 2x + 3) - (4x^2 + 3x - 1)$  $3x^2 - 6x + 9 - 4x^2 - 3x + 1$  $-x^{2} - 9x + 10$ PTS: 2 REF: 082403ai TOP: Operations with Polynomials KEY: subtraction 32 ANS: 5 PTS: 2 REF: 012504ai **TOP:** Modeling Expressions

33 ANS: y = -2x + 6 $m = \frac{8 - -2}{-1 - 4} = \frac{10}{-5} = -2 \quad y = mx + b$ 8 = -2(-1) + b6 = bTOP: Writing Linear Equations PTS: 2 REF: 012502ai KEY: slope-intercept form 34 ANS: y - 7 = 2(x - 3)PTS: 2 TOP: Writing Linear Equations REF: 082418ai KEY: other forms 35 ANS: Don said that the graph of g(x) is narrower and shifted right 3 units. PTS: 2 REF: 062417ai **TOP:** Transformations with Functions 36 ANS:  $\frac{3240 \text{ ft}^3}{1 \text{ pool}} \bullet \frac{7.5 \text{ gal}}{1 \text{ ft}^3} \bullet \frac{1 \text{ truck load}}{6000 \text{ gal}}$ PTS: 2 REF: 082424ai **TOP:** Conversions 37 ANS: exponential PTS: 2 REF: 012513ai **TOP:** Families of Functions 38 ANS: 1 and 5 PTS: 2 REF: 062420ai TOP: Quadratic-Linear Systems 39 ANS: .05x + .10(2x) + .25(x + 12) = 28PTS: 2 REF: 082404ai TOP: Modeling Linear Equations 40 ANS: \$45 to come to the house PTS: 2 REF: 082412ai **TOP:** Modeling Linear Functions 41 ANS:  $2x^2 - 5x + 5$ PTS: 2 REF: 012506ai TOP: Operations with Polynomials **KEY:** subtraction

42 ANS: 2.1 2.2 2.3 2.4 2.5  $6.4 - 4x \ge -2.8$  $9.2 \ge 4x$  $2.3 \ge x$ PTS: 2 TOP: Solving Linear Inequalities REF: 012522ai 43 ANS: 8/6  $2\sqrt{54} + 2\sqrt{6} = 2\sqrt{9}\sqrt{6} + 2\sqrt{6} = 6\sqrt{6} + 2\sqrt{6} = 8\sqrt{6}$ PTS: 2 REF: 082415ai TOP: Operations with Radicals KEY: addition 44 ANS: exponential growth PTS: 2 REF: 062407ai **TOP:** Families of Functions 45 ANS: 1.50  $\frac{425 - 50}{350 - 100} = 1.5$ PTS: 2 REF: 082410ai TOP: Rate of Change 46 ANS: the hourly labor rate for a cleanup TOP: Modeling Linear Functions PTS: 2 REF: 012505ai 47 ANS: a(t) $a(8) = 2^8 + 25 = 281$  b(8) = 10(8) + 75 = 155  $c(8) = \sqrt{400(8)} + 80 \approx 137$   $d(8) = 2(8+1)^2 - 10(8) + 50 = 132$ PTS: 2 REF: 062411ai **TOP:** Families of Functions 48 ANS: -2 and 8 $x^{2} - 5x - 14 = x + 2$  $x^2 - 6x - 16 = 0$ (x-8)(x+2) = 0x = 8, -2PTS: 2 REF: 082416ai TOP: Quadratic-Linear Systems



50	PTS: 2 ANS: 5 $25r^2 = 625$ $r^2 = 25$ r = +5	REF:	012524ai	TOP:	Graphing Piecewise-Defined Functions
51	PTS: 2 ANS: 3	REF:	062412ai	TOP:	Sequences KEY: difference or ratio
52	PTS: 2 ANS: 50 110-60 = 50	REF:	062408ai	TOP:	Modeling Expressions
53	PTS: 2 ANS: -3 $\frac{-2-4}{3-1} = \frac{-6}{2} = -3$	REF:	062413ai	TOP:	Box Plots KEY: interpret
54	PTS: 2 ANS: $y-7 = \frac{4}{3}(x-2)$ $m = \frac{7-3}{2-1} = \frac{4}{3}$	REF:	082423ai	TOP:	Sequences KEY: difference or ratio
55	PTS: 2 KEY: other forms ANS: h(x) = (x + 1)(x - 3)(x - 3	REF: (x + 4)	fall2302ai	TOP:	Writing Linear Equations
	PTS: 2	REF:	082421ai	TOP:	Zeros of Polynomials