1

Which situation can be modeled by a linear function?

(1) The population of bacteria triples every day.

(2) The value of a cell phone depreciates at a rate of 3.5% each year.

(3) An amusement park allows 50 people to enter every 30 minutes.

(4) A baseball tournament eliminates half of the teams after each round.

2

Jenna took a survey of her senior class to see whether they preferred pizza or burgers. The results are summarized in the table below.

	Pizza	Burgers
Male	23	42
Female	31	26

Of the people who preferred burgers, approximately what percentage were female?

(1) 21.3   (3) 45.6

(2) 38.2   (4) 61.9

3.

When $3a + 7b > 2a - 8b$ is solved for a, the result is

(1) $a > -b$ (3) $a < -15b$

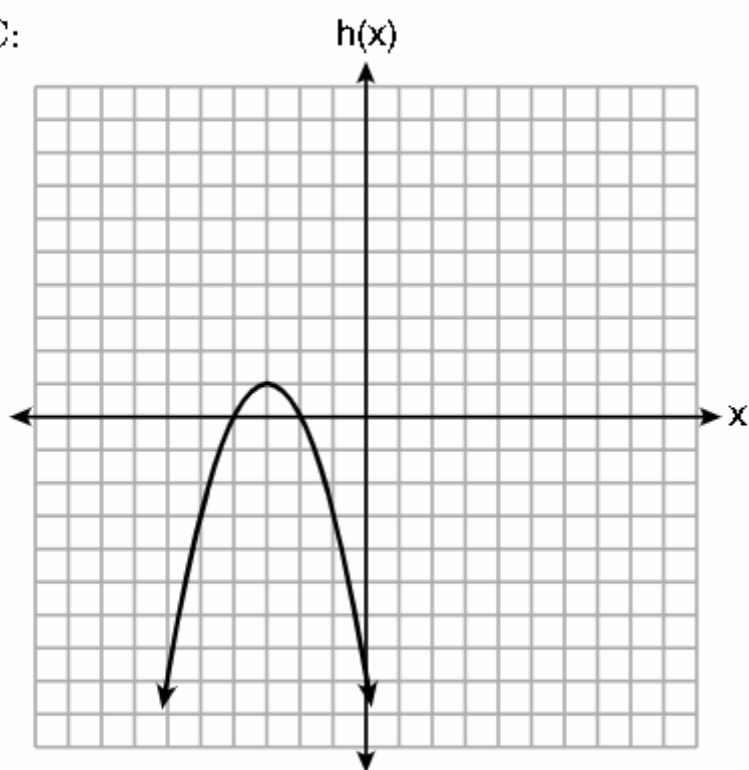(2) $a < -b$ (4) $a > -15b$

4.

Three functions are shown below.

$$A: g(x) = -\frac{3}{2}x + 4$$

$$B: f(x) = (x + 2)(x + 6)$$

C:

h(x)

Which statement is true?

(1) B and C have the same zeros.

(2) A and B have the same y-intercept.

(3) B has a minimum and C has a maximum.

(4) C has a maximum and A has a minimum.

5.

Nicci's sister is 7 years less than twice Nicci's age, a. The sum of Nicci's age and her sister's age is 41. Which equation represents this relationship?

(1) $a + (7 - 2a) = 41$ (3) $2a - 7 = 41$

(2) $a + (2a - 7) = 41$ (4) $a = 2a - 7$

6.

The population of a small town over four years is recorded in the chart below, where 2013 is represented by $x = 0$. [Population is rounded to the nearest person]

Year	2013	2014	2015	2016
Population	3810	3943	4081	4224

The population, $P(x)$, for these years can be modeled by the function $P(x) = ab^x$, where b is rounded to the nearest thousandth. Which statements about this function are true?

        I. $a = 3810$

        II. $a = 4224$

        III. $b = 0.035$

        IV. $b = 1.035$

(1) I and III   (3) II and III

(2) I and IV   (4) II and IV

7.

When written in factored form, $4w^2 - 11w - 3$ is equivalent to

(1) $(2w + 1)(2w - 3)$ (3) $(4w + 1)(w - 3)$

(2) $(2w - 1)(2w + 3)$ (4) $(4w - 1)(w + 3)$

8.

Which ordered pair does *not* represent a point on the graph of $y = 3x^2 - x + 7$?

(1) $(-1.5, 15.25)$ (3) $(1.25, 10.25)$

(2) $(0.5, 7.25)$ (4) $(2.5, 23.25)$

9.

Solve $5x^2 = 180$ algebraically.

10.

Determine and state the vertex of $f(x) = x^2 - 2x - 8$

BONUS

11.

Which of the following is equivalent to the expression below?

$$x^2 + 7x - 60$$

A. $(x + 12)(x - 5)$

B. $(x + 10)(x - 6)$

C. $(x + 15)(x - 4)$

D. $(x + 20)(x - 3)$

High School Mathematics Assessment Reference Sheet

1 inch = 2.54 centimeters   1 kilometer = 0.62 mile   1 cup = 8 fluid ounces
1 meter = 39.37 inches   1 pound = 16 ounces   1 pint = 2 cups
1 mile = 5280 feet   1 pound = 0.454 kilograms 1 quart = 2 pints
1 mile = 1760 yards   1 kilogram = 2.2 pounds   1 gallon = 4 quarts
1 mile = 1.609 kilometers   1 ton = 2000 pounds   1 gallon = 3.785 liters
                                                      1 liter = 0.264 gallons
                                                      1 liter = 1000 cubic centimeters

Triangle	$A = \dfrac{1}{2}bh$
Parallelogram	$A = bh$
Circle	$A = \pi r^2$
Circle	$C = \pi d \ \ or \ \ C = 2\pi r$
General Prisms	$V = Bh$
Cylinder	$V = \pi r^2 h$
Sphere	$V = \dfrac{4}{3}\pi r^3$
Cone	$V = \dfrac{1}{3}\pi r^2 h$
Pyramid	$V = \dfrac{1}{3}Bh$

Quadratic Formula	$x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
Arithmetic Sequence	$a_n = a_1 + (n-1)d$
Geometric Sequence	$a_n = a_1 r^{n-1}$
Geometric Series	$S_n = \dfrac{a_1 - a_1 r^n}{1-r}$ where $r \neq 1$
Radians	1 radian $= \dfrac{180}{\pi}$ degrees
Degrees	1 degree $= \dfrac{\pi}{180}$ radians