Templeton High School: Algebra I: Semester 1 Final REVIEW Name: Key

1. Evaluate:

$2x^2+3x-18 \text{ when } x=4$

$2(4)^2+3(4)-18$

$2(16)+3(4)-18$

$32+12-18$

$44-18$

$\boxed{26}$

2. Simplify

$4n+2(3n-7)-8+n$

$4n+6n-14-8+n$

$11n-14-8$

$\boxed{11n-22}$

3. Find the solution set for

$8x-3=2\left(x-\frac{1}{2}\right)$

$8x-3=2x-1$

$-2x \quad -2x$

$6x-3=-1$

$+3 \quad +3$

$\frac{6x}{6}=\frac{2}{6}$

$\boxed{x=\frac{1}{3}}$

4. Sam spent \$16 on bowling. This included \$2 charge for renting shoes and a \$3.50 per game bowled. Write and solve the equation to find the number of games g that Sam bowled?

$\boxed{16=3.50g+2}$

$16=3.50g+2$

$-2 \quad -2$

$\frac{14}{3.50}=\frac{3.50g}{3.50}$

$\boxed{g=4 \text{ games}}$

5. Solve $q=\frac{r}{2}(s+t)-k$ for t

$+k \quad +k$

$\frac{2}{r}\cdot(q+k)=\frac{r}{2}(s+t)\cdot\frac{2}{r}$

$\frac{2}{r}(q+k)=s+t$

$-s \quad -s$

$\boxed{\frac{2}{r}(q+k)-s=t}$

6. Which number is a solution of the inequality: $x+8<-5$

$-8 \quad -8$

$x<-13$

A. -13

B. -14

C. -3

D. 3

#s less than -13

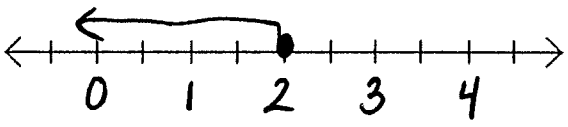
7. Solve and graph

$-15+3a \leq -9$

$+15 \quad +15$

$\frac{3a}{3} \leq \frac{6}{3}$

$a \leq 2$



8. It costs \$7 to make a charm necklace with up to 5 charms and \$1.50 for each additional charm. Kimberly has a budget of \$16 maximum set aside for her necklace. **Write** and **Solve** an inequality for the number of additional charms that Kimberly can have added to her necklace.

$16 \geq 1.50c + 7$

$16 \geq 1.50c + 7$

$-7 \quad -7$

$9 \geq 1.50c$

$\frac{9}{1.50} \geq \frac{1.50c}{1.50}$

$6 \geq c$

$c \leq 6$

9. Convert $\sqrt[7]{x^3}$ to rational exponent form.

A. x^4

B. x^{-21}

C. $x^{\frac{3}{7}}$

D. $x^{\frac{7}{3}}$

10. Simplify the expression $16^{\frac{3}{4}}$.

A. 6

B. 12

C. 8

D. 64

$\left(\sqrt[4]{16}\right)^3$

$(2)^3 = 8$

11. Subtract: $(-8h^2 - 5h + 8) - (9h^2 - 8h + 12)$

add opposite

$-8h^2 - 5h + 8$

$+ \; -9h^2 + 8h - 12$

$-17h^2 + 3h - 4$

12. Multiply: $(3n - 8)(n + 1)$

	$3n$	-8	
n	$3n^2$	$-8n$	$-5n$
1	$3n$	-8	

$3n^2 - 5n - 8$

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13. What is the simplified form of

$(27a^9)^{\frac{2}{3}}$

$(\sqrt[3]{27a^9})^2$

$(3a^3)^2$

$3^2 a^{3\cdot 2}$

$9a^6$

14. Solve the inequality: $\frac{ax}{a} > \frac{b-d}{a}$ for x, given $a < 0$.

divide by a ⊖ flip the sign

so $a = a$ negative #

$x < \frac{b-d}{a}$

A. $x > \frac{b-d}{a}$

B. $x < \frac{b-d}{a}$

C. $x > a(b-d)$

D. $x < a(b-d)$

15. Which statement is equivalent to the inequality $|x-3| > 8$?

great OR

$x-3 > 8$ or $x-3 < -8$

A. $x - 3 > 8$ or $x - 3 < 8$

B. $x - 3 > 8$ or $x - 3 < -8$

C. $x - 3 > 8$ and $x - 3 < 8$

D. $x - 3 > 8$ and $x - 3 < -8$

16. What are the solutions of $x^2 - 16 = 6x$?

$-6x \quad -6x$

$x^2 - 6x - 16 = 0$

-16, $-8 \cdot 2$, -6

$(x-8)(x+2)=0$

$x = 8$ and -2

17. Which of the following does NOT have a factor of $(x + 3)$?

$2x^2(x+3)+7(x+3)$

$(2x^2+7)(x+3)$

A. $2x^3 + 6x^2 + 7x + 21$

-12, $4 \cdot -3$, 1

B. $x^2 + x - 12$ $(x+4)(x-3)$

C. $x^2 - 9$ $(x+3)(x-3)$

D. $x^2 + x - 6$ $(x+3)(x-2)$

-6, $3 \cdot -2$, 1

18. Which expression is NOT equivalent to the polynomial $54x^3 + 81x^2 - 15x$?

$3x(18x^2+27x-5)$ a·c $18(-5)$

$x^2+27x-90$

-90, $30 \cdot -3$, 27

$(x+30)(x-3)$

$\frac{18}{18}$

$(x+\frac{5}{3})(x-\frac{1}{6})$

$(3x+5)(6x-1)$

A. $3x(9x + 1)(2x - 5)$

B. $3x(18x^2 + 27x - 5)$

C. $3x(6x - 1)(3x + 5)$

D. $3(18x^3 + 27x^2 - 5x)$

19. The amount of paint needed to cover a wall is proportional to its area. The wall is rectangular and has an area of $(2b^3 - 72b)$ square meters. Factor the polynomial to find possible expressions for the length and the width of the wall. (Assume the factors are polynomials and factor completely).

$2b^3 - 72b$

$2b(b^2 - 36)$

possible solution ↑ $2b(b+6)(b-6)$

$2b(b+6) \times (b-6)$

20. How many real solutions does the equation $6(x+3)^2 + 2 = 2$ have?

$\frac{-2 \quad -2}{\frac{6(x+3)^2}{6} = \frac{0}{6}}$

the $\sqrt{0}$ is so 1 solution

A. No Solution

B. One Solution $\sqrt{(x+3)^2} = \sqrt{0}$

$x+3 = 0$

C. Two Solutions

$x = -3$

D. Three Solutions

if $\sqrt{+}$ = 2 solution

if $\sqrt{-}$ = No solution

21. Which of the following real numbers are solutions of:

$-7 \le x < 5$

A. 5

B. −3

C. 1

D. −7

22. Which of the following equations have a solution of: $x = 2$

A. $2x - 7 = 11$ $\quad 2x - 7 = 11$, $+7 \; +7$, $\frac{2x}{2} = \frac{18}{2}$, $x = 9$

B. $-2 = 2(x-3)$ $\quad -2 = 2x - 6$, $+6 \; +6$, $\frac{4}{2} = \frac{2x}{2}$, $x = 2$ ✓

C. $2 = 2(x-3) + 2$ $\quad 2 = 2x - 6 + 2$, $2 = 2x - 4$, $+4 \; +4$, $\frac{6}{2} = \frac{2x}{2}$, $x = 3$

D. $5 = -3(x+1) + 14$ $\quad 5 = -3x - 3 + 14$, $5 = -3x + 11$, $-11 \; -11$, $\frac{-6}{-3} = \frac{-3x}{-3}$, $x = 2$ ✓

23. The area of a rectangle is $x^2 + 8x + 12$ feet^2 which of the following are possible dimensions of the length and width?

$6 \times 2 = 12$, $6 + 2 = 8$, $(x+6)(x+2)$

A. When $x = 4$ the dimensions are 10ft x 6ft $(4+6)(4+2)$

B. When $x = 2$ the dimensions are 12ft x 4ft $(2+6)(2+2)$

C. When $x = 1$ the dimensions are 2ft x 6ft $(1+6)(1+2)$

D. When $x = 10$ the dimensions are16ft x 12ft $(10+6)(10+2)$

24. Which of the following expressions simplify to be $3x^4$?

A. $\frac{9x^6}{3x^2}$ $\quad 6-2 \rightarrow 3x^4$

B. $\left(\frac{6x^{-4}}{18x^{-8}}\right)$ $\quad \frac{1x^8}{3x^4} = \frac{x^4}{3}$

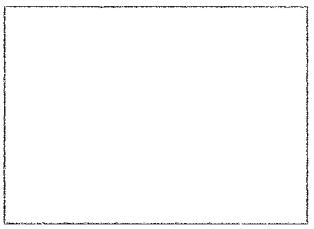
C. $\sqrt[3]{27x^{12}}$ $\quad 3x^4$

D. $\left(\frac{4x}{12x^5}\right)^{-1}$ $\quad 5-1$, $\frac{12x^5}{4x} = 3x^4$

25. Which of the following four rectangles have a perimeter of $4x^2+14x-8$

(A.) ~~B.~~

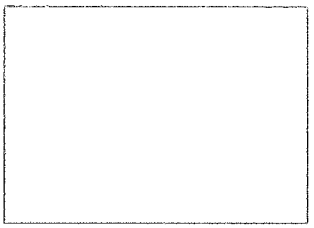
$2(3x^2+2x-5) = 6x^2+4x-10$
$2(-x^2+5x+1) = -2x^2+10x+2$
$4x^2+14x-8$ ✓



$2(2x^2+7x-2) = 4x^2+14x-4$
$2(-2x-4) = -4x-8$
$4x^2+10x-12$ ✗

(C.) ~~D.~~

$2(x^2+8x+7) = 2x^2+16x+14$
$2(x^2-x+3) = 2x^2-2x+6$
$4x^2+14x-8$ ✓



$2(5x^2+9x-4) = 10x^2+18x-8$
$2(-2x^2-2x) = -4x^2-4x$
$6x^2+14x-8$ ✗

Free Response

*****You will be asked to answer 4 of the following 11 questions on your Final.*****

1. Describe how you would interpret a verbal description into a variable expression/equation.

2. Using what you've learned, solve $\frac{1}{2}(4x - 8) = -2x$, and justify the reasoning of your steps.

3. Explain the significance of units, including all the ways they are applied.

4. In what ways are equations and inequalities similar and in what ways are they different?

5. What is absolute value? Why is solving an absolute value equation/inequality treated differently than solving a regular equation/inequality?

6. Create a real-world model for an "and" compound inequality and an "or" compound inequality.

7. Explain in your own words under what conditions the value of exponents change. When do exponents not change? Create some examples to justify your statements.

8. What are rational and irrational numbers? How are radicals related to rational exponents?

9. Describe your favorite way to solve a quadratic equation. Can it be used for any quadratic equation? If not, how would you solve the quadratic equation?

10. What do you think is the significance of setting a quadratic equation equal to zero?

11. Given any factorable quadratic expression, in your own words explain how the values of a, b, and c affect your factoring process.