Name: Key

Algebra 1 Midterm Review

1. Order the following list of numbers from least to greatest.

$\frac{9}{5}$, $1.8\overline{}$, $\frac{5}{3}$ $\sqrt{3}$

A. $1.8\overline{}$, $\frac{5}{3}$, $\sqrt{3}$, $\frac{9}{5}$

B. $\sqrt{3}$, $\frac{9}{5}$, $\frac{5}{3}$, $1.8\overline{}$

C. $\frac{5}{3}$, $\frac{9}{5}$, $1.8\overline{}$, $\sqrt{3}$

D. $\frac{5}{3}$, $\sqrt{3}$, $\frac{9}{5}$, $1.8\overline{}$

③ $\frac{9}{5} = 1.8$

④ $1.8\overline{} = 1.888$

① $\frac{5}{3} = 1.6\overline{}$

② $\sqrt{3} = 1.7$

2. Simplify. $\sqrt{891}$

$= 29.8$

$9 \cdot 11 \cdot 9 \cdot 11$

$=$

A. $8\sqrt{11} = 26.5$

B. $81\sqrt{11} = 268.6$

C. $9\sqrt{11} = 29.8$

D. $8\sqrt{91} = 76.3$

3. $\sqrt{93x}$

The expression above should be further simplified for which value of x?

A. $46/3 = 15.3$ 93

B. $11/3 = 3.6\overline{}$ 1.93

C. $118/3 = 39.3\overline{}$ 3.31

D. $33/3 = 11$

4. Simplify: $7\sqrt{32} - 5\sqrt{18} = 18.38$

A. $17\sqrt{2} = 24.04$

B. $13\sqrt{2} = 18.38$

C. $2\sqrt{13} = 7.2$

D. $5\sqrt{7} = 13.2$

5. The greatest common factor (GCF) of x^3y^k and $x^{2k}y^4$ is x^3y^3. What is the value of k?

A. 1

B. 2

C. 3

D. 4

x^3 | y^3

x^3 x^{2k} | y^k y^4

$k = 3$

6. $21u^3v^3w$ $33u^2vw^4$

Small coefficients

What is the greatest common factor (GCF) of the monomials shown above?

A. $3u^3v^3w^4$

B. $3u^2vw$

C. ~~$231u^5v^4w^5$~~

D ~~$231u^2vw$~~

21

1.21

3.7

33

1.33

3.11

GCF: $3u^2v^1w^1$

7. Evaluate the following expression for $x = 122$.

$2\sqrt{x - 1} + 6$

A. 30

B. 26

C. 16

D. 28

$2\sqrt{122-1} + 6$

$= 2\sqrt{121} + 6$

$= 2(11) + 6 = 22 + 6 = 28$

8. Simplify: $5(12 - |-11 + 5|) - |11 - 7|^2$

A. 38

B. -50

C. -36

D. 14

$5(12 - |-11+5|) - |11-7|^2$

$5(12 - |-6|) - |4|^2$

$5(12-6) - (4)^2$

$5(12-6) - 16$

$5(6) - 16$

$30 - 16 = 14$

9. Alfred is a new photographer. In order for his work to get exposure, Alfred has decided to have a booth at an arts festival. He is charging $19.19 for his color prints and $28.81 for his black and white prints. Which is a reasonable amount that Alfred would make if he sold 6 color prints and 3 black and white prints?

19.19(6) + 28.81(3)
= 201.57

- A. $432.00
- B. $201.00
- C. ($27.00)
- D. $288.00

10. A polynomial expression is shown below.

$(18x^5 - 36x^4) - (sx^3 - 7)(3x^2 - 6x + 2)$ $-(3sx^5 - 6sx^4 + 2sx^3)$

The expression is simplified to $-12x^3 + 21x^2 - 42x + 14$.

What is the value of s?

- A. 6
- B. -3
- C. 3
- D. -6

$18 - 3s = 0$, $-18 \quad -18$, $-3s = -18$, $-3 \quad -3$, $s = 6$

$-36x^4 + 6sx^4 = 0$, $-36 + 6s = 0$, $+36 \quad +36$, $\frac{6s}{6} = \frac{36}{6}$, $s = 6$

$-2sx^3 = -12x^3$, $\frac{-2s}{-2} = \frac{-12}{-2}$, $s = 6$

11. Simplify the following expression.

$(4x + 2)(x - 7)$

$4x^2 - 28x + 2x - 14$
$4x^2 - 26x - 14$

- A. $4x^2 - 26x - 14$
- B. $4x^2 - 30x - 9$
- C. $4x^2 + 26x - 14$
- D. $4x^2 - 26x - 9$

12. Simplify the expression given below.

$(9x^3 - 2)(5x^2 + 2x - 7)$ $-5x^2 - 2x + 5$

$9x^3 - 5x^2 - 2x + 5$

- A. $9x^3 - 5x^2 - 2x + 5$
- B. $9x^3 - 4x^2 - 1x + 5$
- C. $4x^3 - 2x + 5$
- D. $9x^3 + 5x^2 + 2x + 9$

13. Factor the following polynomial completely.

$\frac{9x^3}{9x} - \frac{81x^2}{9x} + \frac{72x}{9x}$

$9x(1x^2 - 9x + 8)$
$9x(x - 1)(x - 8)$

8
1·8
2·4

- A. $9x(x - 1)(x - 8)$
- B. $-9(x^3 + 9x + 8)$
- C. $9x(x - 1)(x + 8)$
- D. $9(x^3 - 9x^2 + 8x)$

14. Four expressions are shown below.

$5\sqrt{x}$ $\quad 5x^2$ $\quad \frac{5}{2x}$ $\quad \frac{x}{5}$

Which inequality comparing two of the expressions is true when $0.2 \le x \le 0.6$?

- A. $\frac{x}{5} > 5x^2$ .2 | $0.04 \not> 0.2$
- B. $5\sqrt{x} > \frac{5}{2x}$ .2 | $2.24 \not> 12.5$
- C. $\frac{x}{5} > \frac{5}{2x}$ .2 | $0.04 \not> 12.5$
- D. $5\sqrt{x} > 5x^2$ .2 | $2.24 > 0.2$ ✓
  .6 | $3.87 > 1.8$ ✓

	$5\sqrt{x}$	$5x^2$	$\frac{5}{2x}$	$\frac{x}{5}$
.2	2.24	0.2	12.5	0.04
.6	3.87	1.8	$4.1\overline{6}$	0.12

15. Factor the polynomial below.

$x^2 + 6x + 8$

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

8
1·8 $\quad 1 + 8 = 9$
2·4 $\quad 2 + 4 = 6$

- A. $(x + 2)(x - 4)$
- B. $(x - 2)(x - 4)$
- C. $(x - 2)(x + 4)$
- D. $(x + 2)(x + 4)$

16. Simplify the following expression.

$$\frac{x-4}{-10x^2+90x-200} \quad x \neq 4, 5$$

- **A.** $\frac{1}{-10x+50}$
- **B.** $-10x-50$
- **C.** $-10x+50$
- **D.** $\frac{1}{-10x-50}$

17. Simplify the following expression.

$$\frac{x^2+6x-16}{(x+8)(x+4)}$$

- **A.** 1
- **B.** $\frac{x+8}{x+4}$
- **C.** $\frac{x-2}{x+4}$
- **D.** $\frac{x-2}{x+2}$

18. Solve for x.

$$7x-4=4x+7x+8$$

- **A.** $x=-\frac{3}{7}$
- **B.** $x=-3$
- **C.** $x=3$
- **D.** $x=\frac{3}{7}$

19. Matt and Casey are wrapping gifts. They bought x rolls of wrapping paper and y packages of ribbon. They spent a total of \$30. The equation below describes the relationship between the number of rolls of wrapping paper and the number of packages of ribbon purchased.

$$6x+3y=30$$

The ordered pair (3, 4) is a solution of the equation. What does the solution (3, 4) represent?

- **A.** Matt and Casey purchased 3 rolls of wrapping paper and 4 packages of ribbon.
- **B.** Wrapping paper costs \$3 per roll, and ribbon costs \$4 per package.
- **C.** Matt and Casey purchased 4 rolls of wrapping paper and 3 packages of ribbon.
- **D.** A package of ribbon costs \$1 more than a roll of wrapping paper.

20. Brian is solving an equation. His work is shown below.

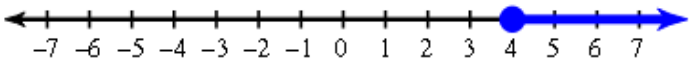
$$3x+(3x+7)=49$$
$$(3x+3x)+7=49$$
$$6x+7=49$$

Which statement describes the procedure Brian used in his work and which property justifies the procedure?

- **A.** **Brian regrouped the terms to multiply 5x and 5x by 9. This procedure is justified by the associative property.**
- **B.** **Brian regrouped the terms to add 3x and 3x. This procedure is justified by the associative property.**
- **C.** **Brian regrouped the terms to add 5x and 5x and 8. This procedure is justified by the commutative property.**
- **D.** **Brian regrouped the terms to multiply 5x and 5x. This procedure is justified by the commutative property.**

21. The solution set of an inequality is listed below.

shade → means ≥



Which inequality has the solution set shown on the number line?

A. $-\frac{x}{6} \leq \frac{-2}{3}$

B. $\frac{x}{6} \leq \frac{-2}{3}$

C. $\frac{x}{6} \leq \frac{2}{3}$

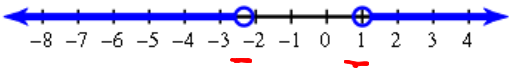
D. $-\frac{x}{6} \leq \frac{2}{3}$

A) $\cdot 6$: $-\frac{x}{6} \leq -\frac{2}{3} \cdot 6$ → $x \geq 4$

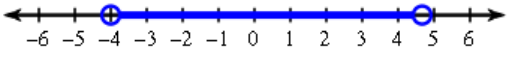
D) $\cdot -6$: $-\frac{x}{6} \leq \frac{2}{3}$ $\cdot x$ → $x \geq -4$

22. Which graph shows the solution set of the inequality: $|3r - 1| > 13$

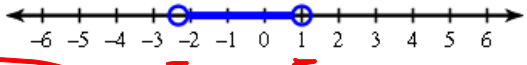
A.



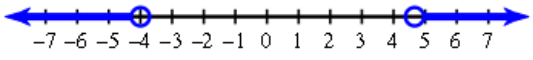
B.



C.



D.



$3r - 1 > 13$ → $+1 \quad +1$ → $\frac{3r}{3} > \frac{14}{3}$ → $r > 4.6$

$3r - 1 < -13$ → $+1 \quad +1$ → $\frac{3r}{3} < \frac{-12}{3}$ → $r < -4$

23. Jeremy makes and sells bobbleheads. His monthly goal is to make a profit over $1,500.

- **He sells each bobblehead for $30.**
- **He has a monthly fixed cost of $725.**

The inequality $30x - 725 > 1{,}500$ models the situation. Which best describes the meaning of x in the inequality?

A. The number of bobbleheads that Jeremy must sell to recover his monthly fixed costs

B. The profit made from 2 months of sales

C. The number of bobbleheads Jeremy must sell to reach his goal

D. The profit made form selling 30 bobbleheads