Algebra I
Unit 8 Review

Name Key

Prime or Composite?

1. 9 composite
2. -3 prime
3. 11 prime
4. -24 composite

Factor each polynomial using the GCF. (Ladder)

5. $15nr^2 - 18m^2nr - 12mn^2r + 3nr$

3 | $15nr^2 - 6m^2nr - 4mn^2r + nr$
n | $5nr^2 - 6m^2nr - 4mn^2r + nr$
r | $5r^2 - 6m^2r - 4mnr + r$
1 | $5r - 6m^2 - 4mn + 1$

$3nr(5r - 6m^2 - 4mn + 1)$

6. $32a^3b^2c^3 + 40a^2bc^3 - 16a^4b^2c^2$

$8a^2bc^2(4abc + 5c - 2a^2b)$

Remember: variable GCF is smallest exponent

A. $8a^2bc^2$ ← that is the GCF, not factored!
B. $8a^2bc^2(4abc + 5c - 2a^2b)$
C. $4a^2bc^2(8abc + 10c - 4ab)$
D. $8abc(4a^2bc^2 + 5ac^2 - 2a^3bc)$

7. $15x^2y - 5xy^3 + 110xy^2$

5 | $15x^2y - 5xy^3 + 110xy^2$
xy | $3x^2y - xy^3 + 22xy^2$
y | $3x - y^2 + 22y$

$5xy(3x - y^2 + 22y)$

8. $8y^7 + 5y^4 + y^2$

$y^2(8y^5 + 5y^2 + 1)$

A. Prime
B. y^2
C. $y^2(8y^5 + 5y^2 + 1)$
D. $y^2(8y^5 + 5y^2)$

Factor each trinomial. (Be sure to check for a GCF first!) Check your answers on the calculator.

9. $4x^2 - 12x + 9$ no GCF

$36x^2$, $-6x$, $-6x$, $-12x$

36: -6, -6

	$2x$	-3
$2x$	$4x^2$	
-3		$+9$

A. $x(4x - 3) - 9(x - 1)$
B. $(2x - 3)(2x + 3)$
C. $(2x - 3)^2 = (2x-3)(2x-3)$
D. Prime

10. $5x^2 + 12x + 7$ no GCF

$5x^2 + 12x + 7$

$35x^2$, $7x$, $5x$, $12x$

$(5x^2 + 7x)(+5x + 7)$
$x(5x+7) + 1(5x+7)$
$(5x+7)(x+1)$

A. $x(5x + 5) + 7(x + 1)$
B. $(5x + 7)(x + 1)$
C. Prime
D. $(x + 7)(5x + 1)$

Factor each trinomial. (Be sure to check for a GCF first!) Check your answers on the calculator.

GCF: 3

11. $3x^2 - 3x - 18 = 3(x-3)(x+2)$

$3(x^2 - x - 6)$

$-6x^2$, $-3x$, $+2x$, $-1x$

	x	-3
x	x^2	$-3x$
$+2$	$2x$	-6

12. $4x^2 - 25 = 4x^2 + 0x - 25$

$-100x^2$, $-10x$, $+10x$, $0x$

$(4x^2 - 10x)(+10x - 25)$

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

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

13. $x^2 - 49 = x^2 + 0x - 49$

$-49x^2$, $-7x$, $+7x$, $0x$

	x	$+7$
x	x^2	$+7x$
-7	$-7x$	-49

$(x+7)(x-7)$

GCF: x

14. $x^3 - 3x^2 - 10x = x(x-5)(x+2)$

$x(x^2 - 3x - 10)$

$-10x^2$, $-5x$, $+2x$, $-3x$

$(x^2 - 5x)(+2x - 10)$

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

A. x(x+2)(x+5)
B. (x+2)(x-5)
C. x(x+2)(x-5)
D. x(x-2)(x-5)

could multiply answer choices

15. The area of a rectangle is $3x^2 + 14x + 8$, and the width is $x + 4$. Which expression best describes the rectangle's length?

A. $2x + 2$ B. $2x + 4$ C. $3x + 2$ D. $3x - 2$

$A = lw$

	x	$+4$
$3x$	$3x^2$	
$+2$		$+8$

16. The area of a rectangle is $x^2 + 2x - 3$. Which of the following could be length and width?

A. width $(x+1)$ and length $(x-3)$
B. width $(x+3)$ and length $(x-1)$
C. width $(x-1)$ and length $(x-3)$
D. width $(x+3)$ and length $(x+1)$

$A = x^2 + 2x - 3$

FACTOR!

$-3x^2$, $-3x$, $+3x$, $+2x$

	x	-1
x	x^2	$-x$
$+3$	$+3x$	-3

length of sides are same

17. If the area of a square is $x^2 + 10x + 25$, what is the length of each side?

A. (x-5) B. (x+5) C. (x+10) D. (x-10)

$25x^2$, $5x$, $5x$, $10x$

$x^2 + 10x + 25$

$5x \quad 5x$

$(x^2 + 5x)(+5x + 25)$

$x(x+5) + 5(x+5)$

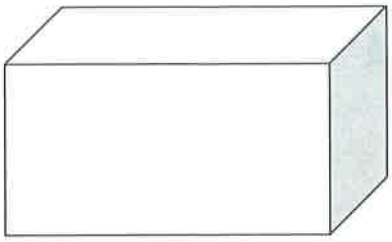
multiply answer choices!

Factor completely GCF: 2

18. The volume of a box is $4x^2+34x+60$, what is the length, width, and height?

A. Length: $4x^2$
Width: 34x
Height: 60

B. Length: (2x+5)
Width: (x+6)
Height: 2



C. Length:2x
Width: (2x+5)
Height: (2x+6)

D. Length: (x+5)
Width: (2x+6)
Height: 2

$2(3x^2+17x+30)$

60
12 | 5

$60x^2$
12x 5x
+17x

	2x	+5
x	$2x^2$	5x
+6	12x	30

19. Which binomial is a factor of $3x^2+5x+2$?

A. $3x-2$

B. $x-1$

C. $x+1$

D. $x+2$

$6x^2$
2x 3x
5x

	x	+1
3x	$3x^2$	3x
+2	2x	+2

Simplify each expression: Exponent Rules (unit 7 Review)

20. $(4x^3yz^2)(-5x^4y^{-6})$

$\frac{-20x^7z^2}{y^5}$

21. $\frac{-(2x^2y)^3(2xy^4)}{4x^3y^2z^0} = \frac{-(8x^6y^3)(2xy^4)}{4x^3y^2}$

$= \frac{-16x^7y^7}{4x^3y^2} = \boxed{-4x^4y^5}$

22. $2(4x^2+3x)-(x+3)(x-2)$ OR BOX

$8x^2+6x-(x^2+-2x+3x-6)$

$8x^2+6x-(x^2+x-6)$

$8x^2+6x-x^2-x+6$

$\boxed{7x^2+5x+6}$

23. $(2x+3)^2 = (2x+3)(2x+3)$

	2x	+3
2x	$4x^2$	6x
+3	6x	+9

$\boxed{4x^2+12x+9}$