

Warm Up



Hand in For Marks

1) $20 - 32a + 40a^3$



$4(5 - 8a + 10a^3)$

2) $x^2 + 4x + 3$



$(x+1)(x+3)$

Handwritten notes for problem 2: "Largest Factor has minus sign" (with an arrow pointing to the constant term 3) and "Both signs same" (with an arrow pointing to the middle term 4x). A small table shows: $\begin{array}{c} x \\ +3 \\ \hline + \\ +4 \end{array}$

3) $-42k + 36k^2 + 30k^3$



$6k(-7 + 6k + 5k^2)$

4) $5x^2 - 45x + 70$

Handwritten notes for problem 4: $\begin{array}{c} x \\ +14 \\ \hline + \\ -9 \end{array}$



$5(x^2 - 9x + 14)$
 $5(x-2)(x-7)$

5) $4n^2 + 21n - 18$



$= 4n^2 + 24n - 3n - 18$
 $= 4n(n+6) - 3(n+6)$
 $(n+6)(4n-3)$

Handwritten notes for problem 5: $\begin{array}{c} x \\ -72 \\ \hline + \\ +21 \end{array}$

6) $10n^2 - n - 24$



Handwritten notes for problem 6: $\begin{array}{r} -1x^22 \\ -2x+36 \\ \hline -3x264 \\ -4x18 \\ -6x15 \\ -8x9 \end{array}$

7) $49x^4 - 4$



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

8) $x^2 + 100$



1) GCF

2) Simple Trinomial $1x^2 \dots$

3) Hard Trinomial $\neq x^2$

4) Diff of Sq

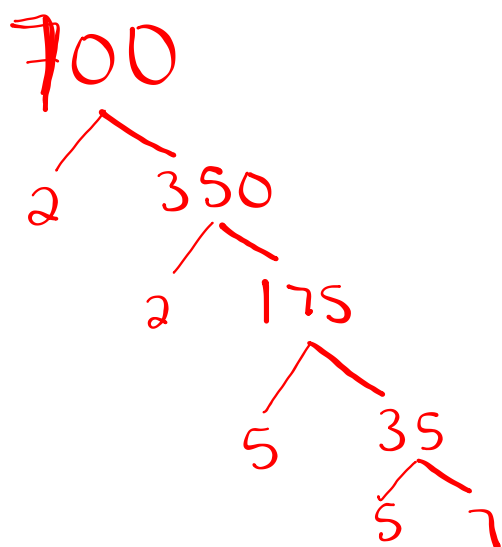
5) Perfect Squ Tri

Prime Numbers

Prime Numbers

A Prime Number can be divided evenly **only** by 1 & itself.
And it must be a whole number greater than 1.

The first few prime numbers are 2, 3, 5, 7, 11, 13, 17 etc.....



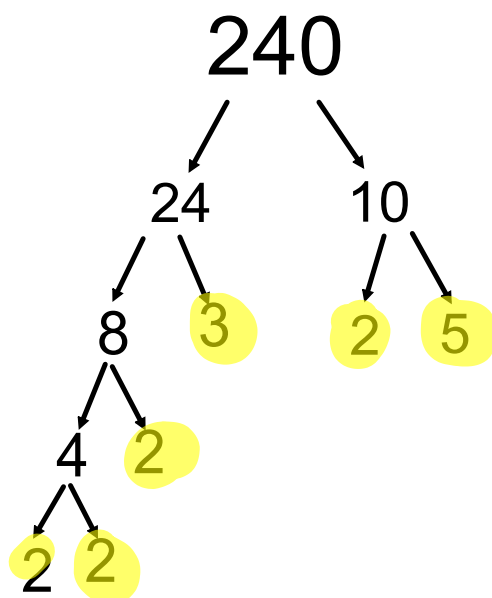
$$2 \times 2 \times 5 \times 5 \times 7$$

$$2^2 \times 5^2 \times 7$$

Determining the Prime Factors of a Whole Number

Write the prime factorization of 240

Draw a Factor
Tree !!



The Prime Factorization of 240 is:

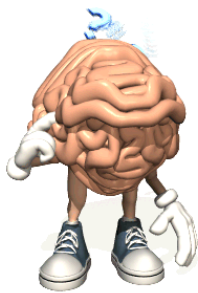
$$2 \times 2 \times 2 \times 3 \times 5 \times 2$$

or

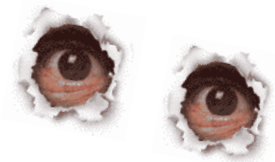
$$2^4 \times 3 \times 5$$

The Prime Factors of 240 are:

2, 3, & 5



Warm Up



What is the greatest common factor of 144 and 216 ?

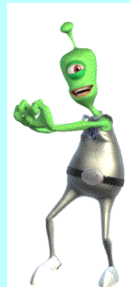
What is the least common multiple of 45 and 30 ?

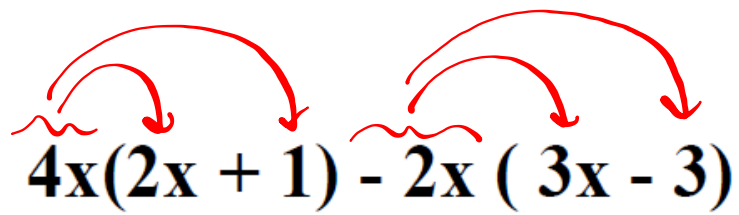
Distributing Factor

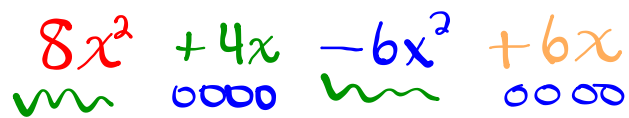
3.7 Multiplying Polynomials

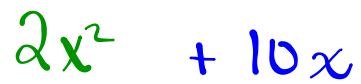
Expand & Simplify

Rainbow




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


$$8x^2 + 4x - 6x^2 + 6x$$


$$2x^2 + 10x$$

$$(x + 4)(x - 3)$$

$$x^2 - \underbrace{3x + 4x} - 12$$

$$x^2 + 1x - 12$$

Expand and collect like terms.

$$2x(5x+3) - 7x(6x-5)$$

$$10x^2 + 6x - 42x^2 + 35x$$

$$10x^2 - 42x^2 + 6x + 35x$$

$$-32x^2 + 41x$$

top
side

$$(x + 4)(x - 3)$$

	x	+4
x	x^2	+4x
-3	-3x	-12

$$x^2 + 4x - 3x - 12$$

$$\boxed{x^2 + 1x - 12}$$

5) $(10x^5 + 3) (-2x^2 - 11x + 2)$

	$-2x^2$	$-11x$	$+2$
$10x^5$			
$+3$			

Expand and simplify

$$(x - 1)^2 + (x + 4)^2$$

Expand and simplify

$$(x - 3)^2$$

Expand and simplify

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

Factoring

There are 5 different kinds of Factoring:

- **Greatest common factor (GCF)**
- **Simple Trinomials (Factor by Inspection)**
- **Hard Trinomials (Factor by Decomposition)**
- **Special Factors**
 - **Difference of Squares**
 - **Perfect Square Trinomials**

Simple Trinomials

- has three terms with the form...

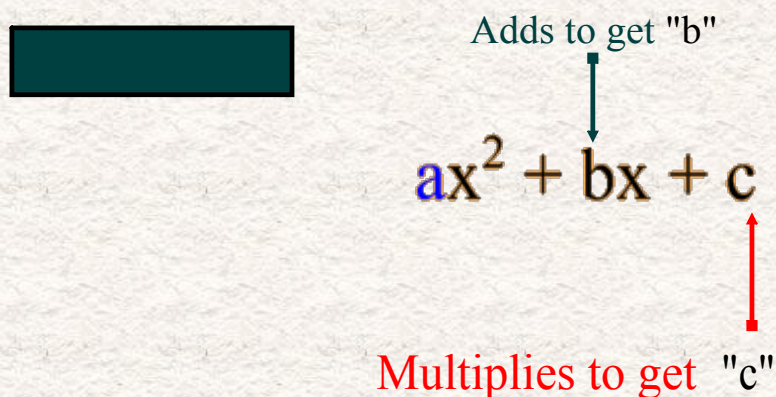
$$ax^2 + bx + c$$

- a simple trinomial has an "a" value of 1.
- we use a method of inspection to factor them.

CHECK IT OUT!!!

INSPECTION METHOD

- here's how it goes... "What two numbers?"

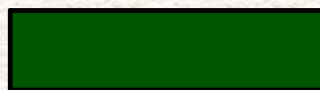


EXAMPLES...

SOLUTIONS

multiply add

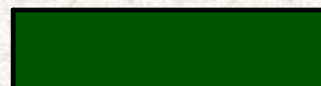
1) $x^2 + 13x - 48$



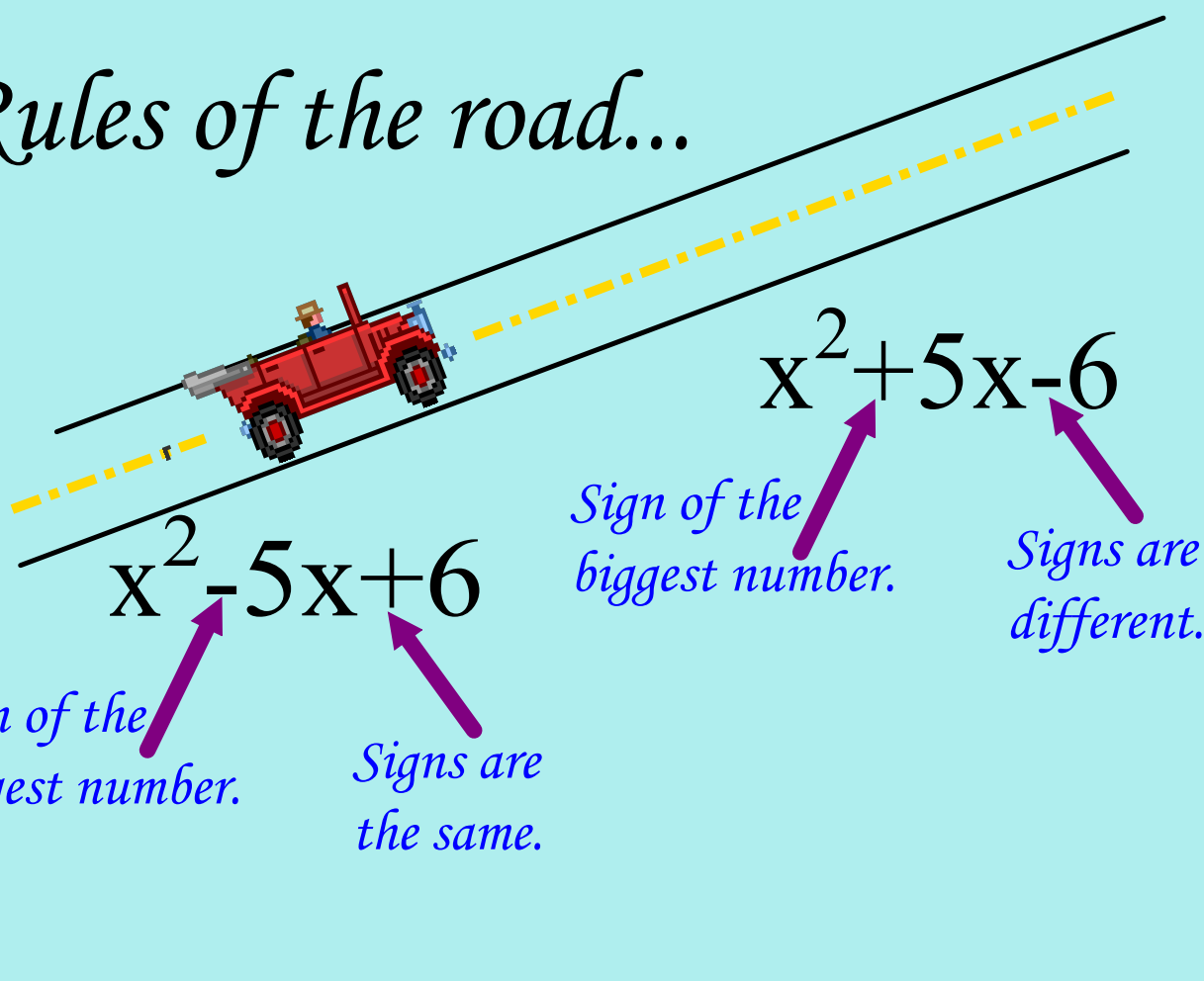
2) $x^2 - 10x - 24$



3) $2x^2 - 20x + 42$



Rules of the road...



$$x^2 + 5x - 6$$

Hard Trinomials

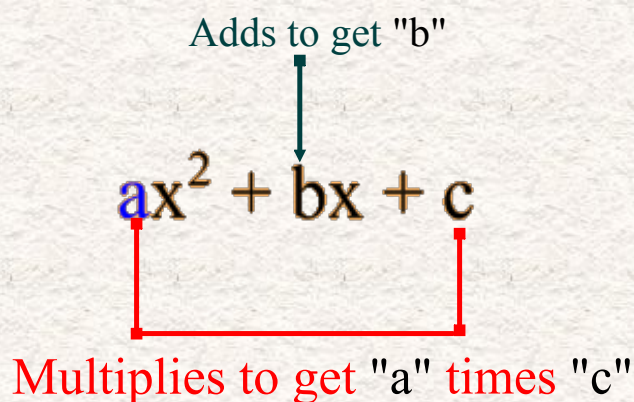
- has three terms with the form...

$$ax^2 + bx + c$$

- a hard trinomial has an "a" value not equal to 1.
- we use a method of decomposition to factor them.

DECOMPOSITION METHOD

- here's how it goes... "What two numbers?"



- once you find the two numbers, use them to break the MIDDLE TERM into two pieces (decomposition).
- then, factor by grouping.

Factor Completely!

1. $2x^2+5x+3$



Difference of Squares

- two terms that are perfect squares.
- must be a difference
- factor like this...

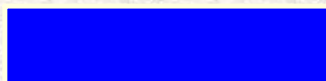
$$a^2 - b^2 = (a + b)(a - b)$$

EXAMPLES...

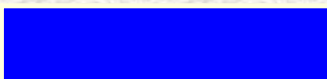
1) $4x^2 - 49$



2) $16x^2 - 9y^2$



3) $81z^4 - 625$



4) $49w^2 - 4s^2$



Perfect Square Trinomials

- three terms: the first and last are perfect squares.
- factors like this...

$$a^2 + 2ab + b^2 = (a + b)^2$$

OR

$$a^2 - 2ab + b^2 = (a - b)^2$$

- recognize them and you save yourself the decomposition steps!!!

EXAMPLES...

1) $25x^2 - 10x + 1$



2) $9x^2 + 24x + 16$



Hand in For Marks

1) $20 - 32a + 40a^3$

2) $x^2 + 4x + 3$

3) $-42k + 36k^2 + 30k^3$

4) $5x^2 - 45x + 70$

5) $4n^2 + 21n - 18$

6) $10n^2 - n - 24$

Math 10

Name _____

Factoring: Difference of Squares and Perfect Squares

Date _____

Factor each completely.

1) $n^2 - 9$

2) $25a^2 - 9$

3) $k^2 - 4$

4) $16x^2 - 9$

5) $x^2 - 25$

6) $25x^2 - 16y^2$

7) $u^2 - 16v^2$

8) $u^2 - 9v^2$

9) $4x^2 - y^2$

10) $a^2 - 25b^2$

11) $9m^2 + 12m + 4$

12) $16r^2 + 8r + 1$

13) $25x^2 - 20x + 4$

14) $16n^2 + 40n + 25$

15) $9b^2 - 24b + 16$

16) $16m^2 - 24mn + 9n^2$

17) $9x^2 - 6xy + y^2$

18) $25x^2 + 10xy + y^2$

19) $x^2 - 8xy + 16y^2$

20) $9x^2 + 24xy + 16y^2$

Review Questions

Q

1. $9x^2 - y^2$

2. $2x^2 - x - 15$

3. $3a^2b^2 + 27a^4b^7 - 12a^6b^5$

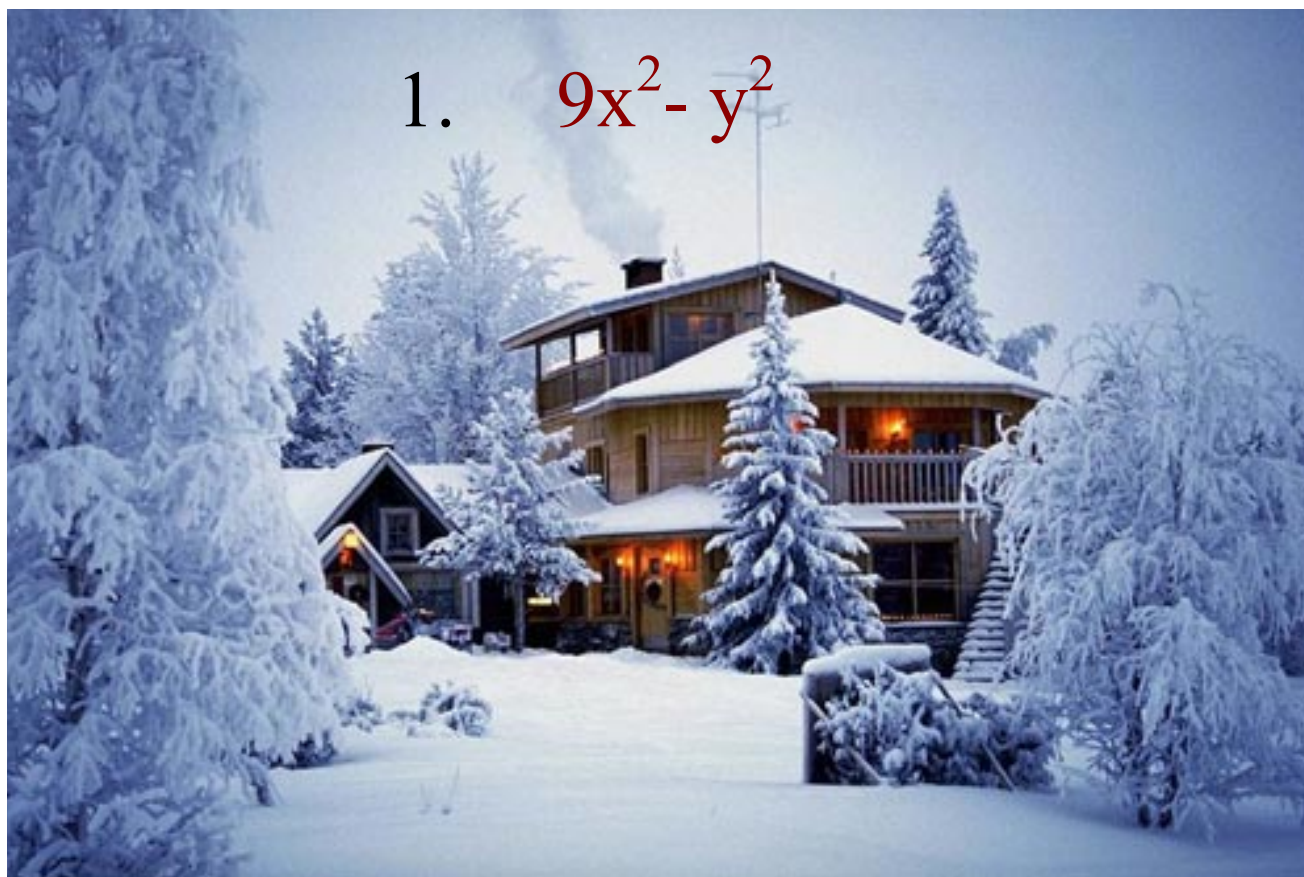
4. $3x^2 - 27x + 42$

5. $24x^4 + 10x^2 + 4$

Tricky

6. $(x+1)^2 - (x+5)^2$

1. $9x^2 - y^2$

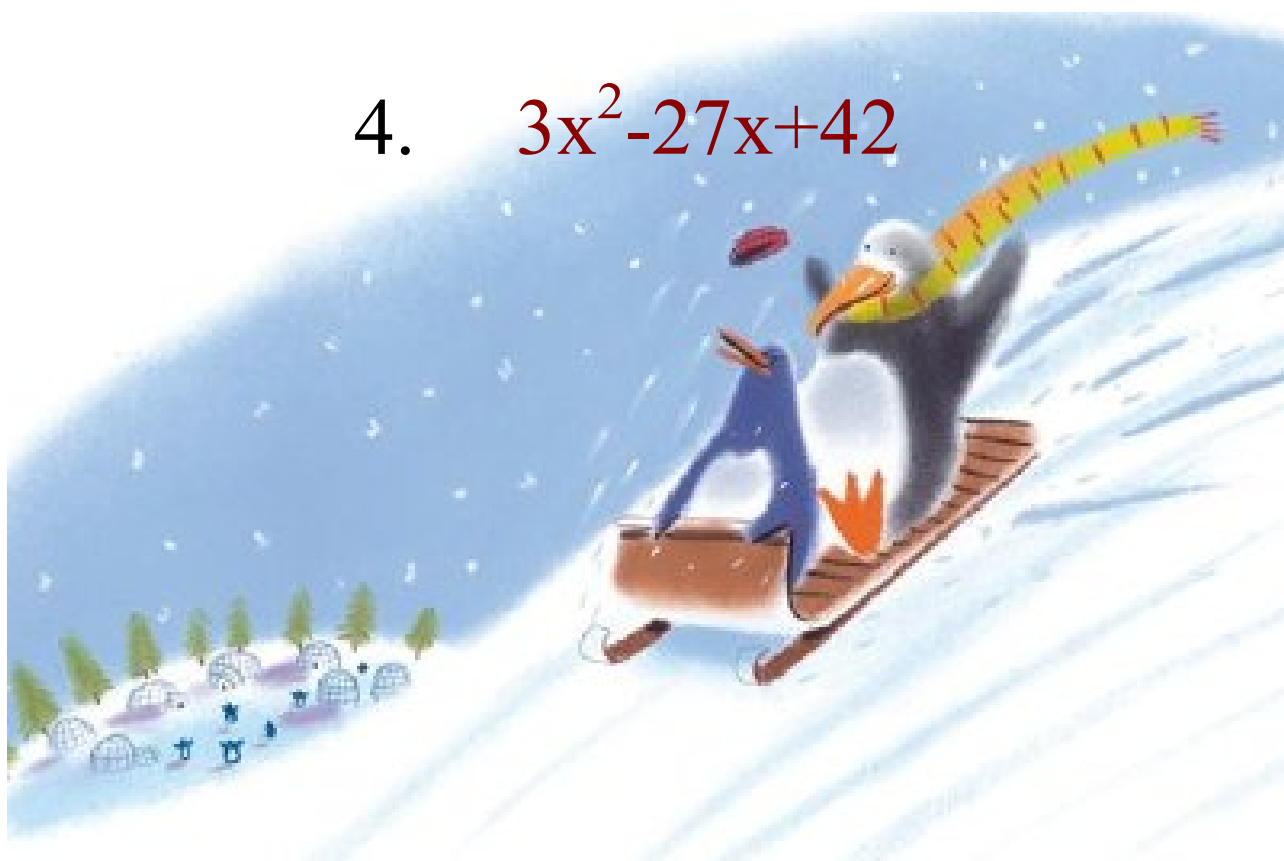




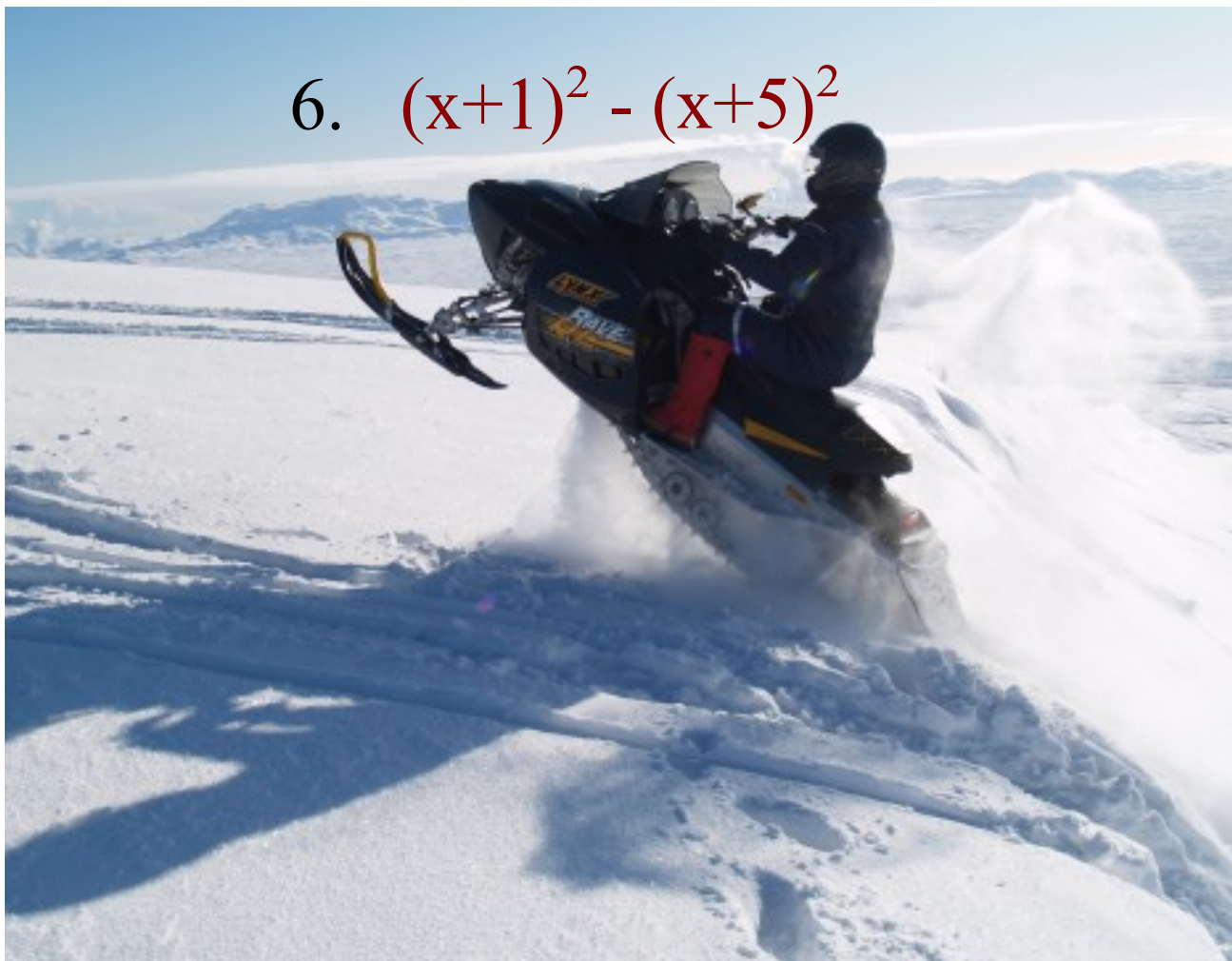
3. $3a^2b^2 + 27a^4b^7 - 12a^6b^5$



4. $3x^2 - 27x + 42$



6. $(x+1)^2 - (x+5)^2$



7. $(x-2)^2 - 9(x+1)^2$



Factoring Review

Math 10B

Factor each completely :

1) $6b^2a^2 - 24b^2$

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

3) $x^2 - 4y^2$

4) $m^2 - 10m - 11$

5) $25x^2 - 30x + 9$

6) $2n^2 - 9n + 9$

7) $15x^2 - 12y^2$

8) $2a^2 - 7a^2 - 20a + 70$

9) $4x^2 + 10xy + 625y^2$

10) $36n^2 - 32$

11) $a^2 - 9a - 36$

12) $6v^3 - 48v - 2v^2 + 16$

13) $-56x^3 + 80$

14) $9m^4 + 30m^2n^2 + 25n^4$

15) $5v^2 - 26v - 63$

16) $64x^2 - 36y^2$

17) $2x^2 - 2x - 40$

18) $4x^2 - 25$

19) $3x^2 - 17xy + 10y^2$

20) $40x^3 - 5x^2 - 32x + 4$

21) $25r^2 - 49$

22) $p^2 - 5p - 84$

