

For question 1 - 3, **simplify**, write in standard form, and **classify** using the degree and # of terms.

1. $(8x^3 + 14x^2 - 2) + (-2x^3 + 7)$

Standard form: $6x^3 + 14x^2 + 5$

Classify- Degree: Cubic

Classify- # of term(s): trinomial

2. $(x^5 - 10x^3 + 5x - 3) - (x^4 - 5x^3 + 1)$

Standard form: $x^5 - x^4 - 5x^3 + 5x - 4$

Classify- Degree: Quintic

Classify- # of term(s): Polynomial

3. $(3x + 6)(2x - 4)$ Box or FOIL

Standard form: $6x^2 - 24$

Classify- Degree: Quadratic

Classify- # of term(s): Binomial

	3x	6
2x	6x ²	12x
-4	-12x	-24

Factor Completely. SHOW ALL WORK.

Factor normally
4. $x^2 + 3x - 40$

$= (x+8)(x-5)$

*	-40
8	+ -5
	3

Pull out the GCF 1st
5. $2x^2 - 10x + 8$

$2(x^2 - 5x + 4)$
 $= 2(x-4)(x-1)$

*	4
-4	+ -1
	-5

Pull out the GCF 1st
6. $2x^3 - 13x^2 - 7x$

$x(2x^2 - 13x - 7)$
 $= x(2x+1)(x-7)$

*	-14
-14	+ 1
	-13

2x	2x ²	-14x
1	1x	-7

Treat as an x^2
7. $x^4 + 4x^2 - 12$

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

*	-12
6	+ -2
	4

cannot factor any further

Use Reverse Box Method

8. $12x^5 - 2x^4 - 30x + 5$

	6x	-1
2x ⁴	12x ⁵	-2x ⁴
-5	-30x	5

$= (2x^4 - 5)(6x - 1)$

When you see "= 0" GET RID OF THE GCF!

Solve by factoring. Show ALL work and give exact answers.

9. $x^2 - x + 4 = 0$ have to use Quadratic formula
 $a=1$ $b=-1$ $c=4$

$$X = \frac{1 \pm \sqrt{(-1)^2 - 4(1)(4)}}{2(1)}$$

$$X = \frac{1 \pm \sqrt{-15}}{2} = \frac{1 \pm \sqrt{15}i}{2}$$

10. $2x^2 + 15x = 8$
 $2x^2 + 15x - 8 = 0$

$$= (2x-1)(x+8)$$

$$\begin{array}{|l} 2x-1=0 \\ \hline x = \frac{1}{2} \end{array} \quad \begin{array}{|l} x+8=0 \\ \hline x = -8 \end{array}$$

~~$$\begin{array}{r} * \\ -16 \\ + \\ 15 \\ -1 \end{array}$$~~

	x	8
$2x$	$2x^2$	$16x$
-1	$-1x$	-8

11. Solve by the square root method. Give exact answers.

$$\frac{2x^2}{2} + \frac{18}{2} = \frac{0}{2}$$

$$\sqrt{x^2} = \sqrt{-9}$$

$$x = \pm 3i$$

Remember:

* negative under the radical means "i"

12. Solve by completing the square. Give exact answers.

$$\frac{2x^2}{2} - \frac{24x}{2} + \frac{10}{2} = \frac{0}{2}$$

$$x^2 - 12x + 5 = 0$$

$$x^2 - 12x + \boxed{36} = -5 + \boxed{36}$$

$$(x-6)^2 = 31$$

$$\sqrt{(x-6)^2} = \pm \sqrt{31}$$

$$x-6 = \pm \sqrt{31}$$

$$\boxed{x = 6 \pm \sqrt{31}}$$

take middle # chop in 1/2 then square it!

13. Solve by the quadratic formula. Give exact answers.

$$2x^2 - 7x + 8 = 0$$

$$a=2 \quad b=-7 \quad c=8$$

$$X = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$= \frac{7 \pm \sqrt{(-7)^2 - 4(2)(8)}}{2(2)}$$

$$x = \frac{7 \pm \sqrt{-15}}{4}$$

$$\boxed{x = \frac{7 \pm \sqrt{15}i}{4}}$$