Algebra 2—H

EXTRA PROBLEMS 5.2-5.4

Ch 5 Handout C

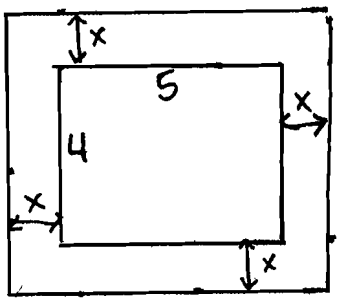
Write equations for word problems!
Do word problems on this paper. Do all other problems on your homework paper.

1. The sum of the squares of two consecutive positive odd integers is 202. Find the integers.

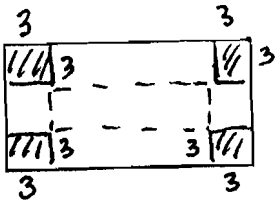
2. In a right triangle, the longer leg is 3 more than the shorter leg, and the hypotenuse is 6 more than the shorter leg. Find the length of the hypotenuse. (Hint: use Pythagorean Theorem)

3. The formula $h = k + vt - 4.9t^2$ gives the approximate height h in meters of an object t seconds after it is projected upward from a height of k meters at an initial speed of v meters per second (m/s). A ball is thrown upward from the top of a tower 49 m high at an initial speed of 14.7 m/s. After how many seconds will the ball strike the ground?

4. Grandma made a quilt that measures 4 feet by 5 feet. She wants to use the remaining 10 sq. feet of fabric to add a decorative border of uniform width. What should the width of the border be?



5. A rectangular sheet of metal is formed into an open-topped box by cutting equal squares from the corners and bending up the flaps. Find the dimensions of the metal sheet if it is twice as long as it is wide and 3-cm. squares are cut out to form a box having volume 168 sq. cm.



Factor over the real numbers:

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

7. $16x^4-72x^2+81$

8. $x^2+\frac{3}{5}x-\frac{4}{25}$

9. $4x^2-112$

10. $2x+5\sqrt{x}+2$

11. $49x-42\sqrt{x}+9$

Simplify:

12. $\left(6\sqrt{2}\right)^2$

13. $\left(2-\sqrt{7}\right)^2$

14. $\left(2\sqrt{y}-1\right)\left(2\sqrt{y}+1\right)$

15. $\frac{6}{\sqrt{3}+1}$

16. $\frac{3}{\sqrt{5}-\sqrt{2}}$

17. $\frac{1}{\sqrt{x}-4}$

18. i^{20}

19. i^{23}

20. $(-4i)^2$

21. $\left(2i\sqrt{3}\right)^2$

22. $i\sqrt{2}\cdot i\sqrt{10}$

23. $\sqrt{-2}\cdot\sqrt{-48}$

24. $\frac{1}{i}-\frac{1}{2}+\frac{3}{2i}$

25. $\left(1+i\sqrt{6}\right)^2$

26. $(1+i)^3$

27. Two complex numbers $a+bi$ and $c+di$ are equal if and only if $a=c$ and $b=d$.

Find x and y if $2x+y+3yi=5-xi$.

28. Find and simplify the reciprocal of $\frac{2+6i}{5}$.

29. Show by substitution that $2+i$ is a solution of $x^2-4x+5=0$.