

## Math 10 – Final Exam REVIEW

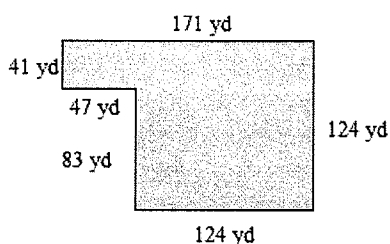
Create your comprehensive study guide – your one page, both sides, hand-written, study guide. As you work through the 3 comprehensive quizzes (26, 27, 28) and encounter a concept you don't remember, write it down on the study guide. There are NO associated practice problems for quizzes 26, 27, 28, so spend the time working through the large comprehensive quizzes.

Then, using your study guide, work through each of these 50 problems on this Final Exam Review. Set aside about 3 hours (it doesn't have to be all at once) to complete these problems. [Hmmm... Could there be a reason why I selected these specific 50 problems?]

Bring your work and your questions to the special review session. (Answers will be posted on the web page after the review session.)

Review your study guide as needed. Bring your study guide, your ID, pencils, and a simple calculator to the Final Exam. The Final will contain 35, two-point questions.

1. Find the perimeter: PERIMETER = distance around outside



$$\begin{array}{r} 171 \\ 124 \\ 124 \\ 83 \\ 47 \\ + 41 \\ \hline 590 \end{array}$$

The perimeter is 590 yards.

2. JG was in charge of mailing batches of letters. So far, the four batches mailed contained 196, 438, 789, and 829 letters. Rounding each batch to the nearest hundred, approximately how many letters (in hundreds) were mailed?

Look at tens. IF 5 or more  
Round up.

batches	rounded
196	200
438	400
789	800
829	800
	2200

Approximately 2200 letters were mailed.

3. Evaluate:  $5 \div 0$  and  $0 \div 5$

$5 \div 0 = \frac{5}{0}$  is undefined       $0 \div 5 = \frac{0}{5} = 0$

4. EZ has \$617 to spend on chairs. If each chair costs \$79, does EZ have enough to purchase eight chairs? If so, how much money will be left over? If not, how much does EZ need?

$$\begin{array}{r} 79 \text{ per chair} \\ * 8 \text{ chairs} \\ \hline 632 \text{ for 8 chairs} \end{array}$$

needs 632  
has 617

---

needs 15 more

EZ does not have enough for 8 chairs. EZ needs \$15 more.

5. EZ traveled at an average speed of 58 mph for a trip. If EZ drove 754 miles, how many hours was the trip?

$$754 \text{ mi} \div 58 \text{ mi per hr}$$

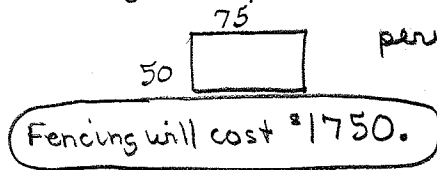
$$\frac{754 \text{ mi}}{58 \text{ mph}} = 13 \text{ hours}$$

The trip was 13 hours.

6. Simplify:  $\frac{25-5}{2^2+6} \Rightarrow \frac{20}{4+6} \Rightarrow \frac{20}{10} \Rightarrow \boxed{2}$

7. Simplify:  $40 \div 8 \cdot 12$    
*Division and multiplication in order appear*   
 $40 \div 8 = 5$    
 $5 \cdot 12 = \boxed{60}$

8. What is the cost of fencing to fence a rectangular backyard that is 50 ft by 75 ft, if the fencing costs \$7 per foot?



perimeter =  $50 + 75 + 50 + 75$   
 $= 250 \text{ ft}$   
 $\times 7$   


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 $1750$

9. Rearrange these items from least to greatest. List them in given unsimplified form.

$-(-15)$  ,  $|-3|^2$  ,  $4^2$  ,  $(-6^2+10)$  ,  $-|-3|$  ,  $25^0$   
 $15$  ,  $3^2$  ,  $16$  ,  $-36+10$  ,  $-3$  ,  $1$   
 $9$  ,  $-26$

IN ORDER

$(-6^2+10)$  ,  $-|-3|$  ,  $25^0$  ,  $|-3|^2$  ,  $-(-15)$  ,  $4^2$

10. EZ had a balance of \$2,047 at the beginning of the week. EZ wrote two checks for \$25 and \$130; made two deposits for \$224 and \$193; and withdrew \$200 at the ATM. What is EZ's balance now?

**Balance \$2,109.**

2047	
-155	1892
+417	+417
-200	2309
2109	-200
	2109

checks	25
	130
-155	

deposits	224
	193
+417	

ATM  
-200

11. Simplify:  $\frac{67 - (-2)(4)}{-11 - 2^2}$

$\frac{67 - (-8)}{-11 - 4} \Rightarrow \frac{75}{-15} \Rightarrow \boxed{-5}$

12. Solve the equation for the value of  $x$ :  $6(x+3) = -6 + 4x$

distribute

$$\begin{array}{r} 6x + 18 = -6 + 4x \\ -4x \quad \quad -4x \\ \hline 2x + 18 = -6 \\ -18 \quad \quad -18 \\ \hline 2x = -24 \\ \frac{2x}{2} = \frac{-24}{2} \\ x = -12 \end{array}$$

move the smaller amount of  $x$  to larger side

isolate variable term

isolate variable

$x = -12$

Be sure to check the answer!

13. Solve the equation for the value of  $x$ :  $35 - (4p - 15) = 17 - 3(p - 2)$

$$\begin{array}{r} 35 - 4p + 15 = 17 - 3p + 6 \\ -4p + 50 = 23 - 3p \\ +4p \quad \quad \quad +4p \\ \hline 50 = 23 + p \\ -23 \quad \quad -23 \\ \hline 27 = p \end{array}$$

combine terms on sides

$p = 27$

14. EZ takes a two day drive for a total of 396 miles. If EZ drove three times as far the first day as the second day, how far did EZ drive each day?

$x =$  second day  
 $3x =$  first day

$$x + 3x = 396 \text{ mi}$$

$$4x = 396$$

$$x = 99$$

99 mi on second day  
 297 mi on first day

15. EZ worked twice as many hours as TK. BB worked 15 more hours than TK. If they worked a total of 95 hours, how many hours did each one work?

TK =  $x$   
 EZ =  $2x$   
 BB =  $x + 15$

$$\begin{array}{r} x + 2x + (x + 15) = 95 \\ 4x + 15 = 95 \\ -15 \quad \quad -15 \\ \hline 4x = 80 \\ \frac{4x}{4} = \frac{80}{4} \\ x = 20 \end{array}$$

TK worked 20 hours.  
 EZ worked 40 hours.  
 BB worked 35 hours.

16. EZ completed 32 out of 36 assignments in her course. BB completed 6 out of 27 assignments. What fractional part did each student complete? Which one completed more of the course?

EZ:  $\frac{32}{36}$       BB:  $\frac{6}{27}$

or  $\frac{8}{9}$       or  $\frac{2}{9}$

EZ completed  $\frac{8}{9}$   
 BB completed  $\frac{2}{9}$   
 EZ completed more.

17. A developer sells lots of land in parcels of  $\frac{3}{2}$  acre. If the developer has 72 acres, how many parcels of land can be sold?

$$72 \div \frac{3}{2}$$

$$\frac{24}{1} \cdot \frac{2}{3} = 48$$

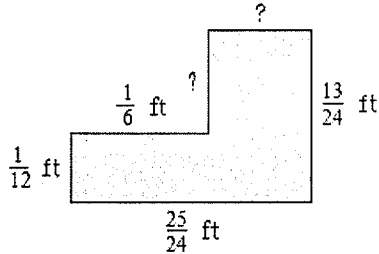
Can sell 48 parcels of land.

18. Find the Lowest Common Multiple (LCM) of 9, 12 and 15.

use a factor tree

$$\begin{array}{r}
 9: 3 \cdot 3 \\
 12: 3 \cdot 2 \cdot 2 \\
 15: 3 \cdot 5 \\
 \hline
 \text{LCM: } 3 \cdot 3 \cdot 2 \cdot 2 \cdot 5 \text{ one from every column} = 180
 \end{array}$$

19. Find the missing dimensions. Write each in lowest terms.



$$\text{Top} = \frac{25}{24} - \frac{1}{6}$$

$$\text{Side} = \frac{13}{24} - \frac{1}{12}$$

$$\frac{25}{24} - \frac{4}{24}$$

$$\frac{13}{24} - \frac{2}{24}$$

$$\text{Top} = \frac{21}{24} \text{ ft}$$

$$\text{Side} = \frac{11}{24} \text{ ft}$$

20. Multiply the mixed numbers. Simplify to lowest terms.  $2\frac{5}{14} \cdot 1\frac{9}{16} \cdot 3\frac{7}{15}$

$$2\frac{5}{14} \cdot 1\frac{9}{16} \cdot 3\frac{7}{15}$$

$$\begin{array}{ccc}
 3 \cdot 11 & 5 \cdot 9 & 1 \cdot 2 \cdot 13 \\
 \frac{33}{14} \cdot \frac{25}{16} \cdot \frac{52}{15} \\
 2 \cdot 7 & 2 \cdot 2 \cdot 2 \cdot 2 & 3 \cdot 5
 \end{array}$$

$$= \frac{11 \cdot 5 \cdot 13}{7 \cdot 2 \cdot 2 \cdot 2}$$

$$= \frac{715}{56}$$

Do NOT convert to a decimal!

21. Perform the indicated operation. Write the answer in simplified form.  $-3\frac{2}{3} - (-\frac{3}{4})$

$$-3\frac{2}{3} + \frac{3}{4}$$

$$-2\frac{8}{12} + \frac{9}{12}$$

$$-2\frac{20}{12} + \frac{9}{12}$$

$$-3\frac{8}{12} + \frac{9}{12}$$

$$+ \frac{9}{12}$$

$$+ \frac{9}{12}$$

$$= \text{OR} = -\frac{44}{12} + \frac{9}{12} = -\frac{35}{12}$$

$$\Rightarrow -2\frac{11}{12}$$

22. Solve the equation for the value of  $x$ :  $\frac{1}{8} + \frac{x}{7} = \frac{47}{56}$  Eliminate all denominators by multiplying EVERY term by the LCD of 56.

$$\left(\frac{7}{56}\right) \cdot \frac{1}{8} + \left(\frac{8}{56}\right) \cdot \frac{x}{7} = \left(\frac{56}{56}\right) \cdot \frac{47}{56}$$

$$7 + 8x = 47$$

$$8x = 40$$

$$x = 5$$

$$\{5\}$$

Be sure to check your answer.

23. Solve the equation for the value of  $x$ :  $8x - \frac{7}{8} = \frac{1}{4}$

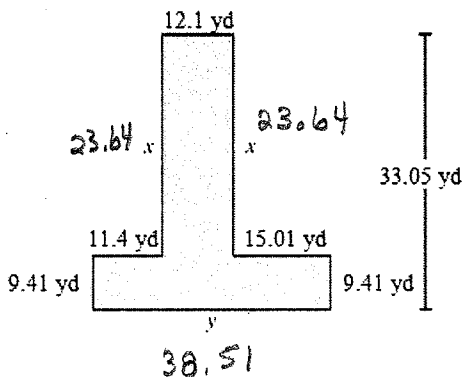
$(8) \cdot 8x - \frac{7 \cdot (8)}{8} = \frac{1}{4} \cdot (8)$   
 $64x - 7 = 2$   
 $\frac{64x}{64} - \frac{7}{64} = \frac{2}{64}$   
 $x = \frac{9}{64}$

$\left\{ \frac{9}{64} \right\}$

24. Round 39.8994 to the nearest hundredths.

Look  
 39.90 ← must keep '0' in hundredths

25. Find the length of the sides  $x$  and  $y$ . Then find the perimeter.



$x = 33.05$   
 $- 9.41$   
 $\hline 23.64$

$y = 11.4$   
 $+ 12.1$   
 $+ 15.01$   
 $\hline 38.51$

Perimeter =  
 $12.1$   
 $23.64$   
 $15.01$   
 $9.41$   
 $38.51$   
 $9.41$   
 $11.4$   
 $23.64$   
 $\hline 143.12$

perimeter is 143.12 yd

26. EZ owes \$42,205.23 on the mortgage for the house. If the monthly payment is \$611.67, how many monthly payments does EZ have to make?

$611.67 \overline{) 42205.23}$   
 $367002$   
 $\hline 550503$   
 $550503$   
 $\hline 0$

EZ must make 69 payments.

27. A night at a hotel in Candyland costs \$111.15 with a nightly room tax of \$24.00. The hotel also charges \$1.50 per phone call made from the phone in the room. If EZ stays for 7 nights and makes 9 phone calls, how much is EZ's total bill?

Night  $111.15$   
 $+ 24.00$   
 $\hline 135.15$  per night  
 $\times 7$  nights  
 $\hline 946.05$

phone call  $1.50$   
 $\times 9$  calls  
 $\hline 13.50$

$946.05$  hotel  
 $+ 13.50$  phone calls  
 $\hline 959.55$

EZ's total bill was \$959.55

28. Multiply the equation by the appropriate value(s) to rewrite the equation without decimals:

$$1.6y + 3.2 = 1.85y + 2.2$$

$$160y + 320 = 185y + 220$$

need to multiply all terms by 100

cannot multiply some by 10 and some by 100!

29. Solve the application. EZ bought a popcorn, a soda, and a hotdog at the movies for \$10.57. Popcorn costs \$1 more than a hotdog. A soda costs \$0.93 less than a hotdog. How much is each item?

hotdog = H  
 popcorn = H + 1  
 soda = H - .93

$$10.57 = 3H + .07$$

$$- .07$$


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$$10.50 = 3H$$

$$10.57 = H + (H + 1) + (H - .93)$$

$$3.50 = H$$

$$3.50 = H$$

3.50	check	3.50
- .93		4.50
2.57	+ 2.57	10.57
		total

✓

Hotdog costs \$3.50  
 popcorn costs \$4.50  
 soda costs \$2.57

30. Solve the proportion for the unknown value of x.  $\frac{x}{6} = \frac{-39}{18}$

$$\frac{x}{6} = \frac{-39}{18}$$

$$\frac{18x}{18} = \frac{-39(6)}{18}$$

$$x = -13$$

OR  $18x = -234$   
 $x = -13$

31. At 1:00 pm, the 7 ft tall lamp post casts a 3 ft long shadow. At the same time, the nearby oak tree casts an 18 ft long shadow. How tall is the oak tree?

Item	7 <sup>post</sup>	X <sup>tree</sup>
shadow	3 <sub>shadow</sub>	18 <sub>shadows</sub>

$$7 \cdot 18 = 3 \cdot X$$

$$126 = 3X$$

$$42 = X$$

OR  $\frac{7}{3} = \frac{X}{18}$

$$\frac{7 \cdot 6}{3 \cdot 6} \rightarrow \frac{X}{18} \quad \times 6$$

The tree is 42' tall.

32. Convert the decimal to a percent: 0.6804

$$\frac{68.04}{100}$$

Convert the fraction to a percent:

$$\frac{7}{8} = 87.5\%$$

$$8 \overline{) 7.00}$$

OR  $68.04\%$

33. In a recent survey 44% of the people in the United States say that gas prices have affected the type of vehicle they will buy. In a sample of 300 people who are in the market for a new vehicle, how many would you expect to be influenced by gas prices?

$$44 \cdot 300 = 100X$$

$$13200 = 100X$$

$$132 = X$$

$$\frac{44}{100} = \frac{X}{300 \text{ sample}}$$

$$\frac{44 \cdot 3}{100 \cdot 3} = \frac{132}{300}$$

132 people

34. Solve for the unknown amount: 0.85% of 500 is what number?

$$4.25$$

careful

$$\frac{.85}{100} = \frac{X}{500}$$

$$100X = .85(500)$$

$$100X = 425$$

$$X = 4.25$$

35. EZ gets a 23% discount at the cafeteria at work. If the lunch bill originally comes to \$5.10, what is the price after the discount? (Remember, discounts are rounded down to the nearest penny.)

$$5.10 - .23(5.10)$$

$$\begin{array}{r} 5.10 \\ + .23 \\ \hline 1.173 \end{array}$$

discount  
1.17 discount

$$\begin{array}{r} 5.10 \\ - 1.17 \\ \hline 3.93 \end{array}$$

lunch will cost \$3.93

36. EZ put new insulation in the attic and discovered that the heating bill for December decreased from \$150 to \$120. What is the percent of decrease?

$$\begin{array}{r} 150 \\ - 120 \\ \hline 30 \end{array}$$

$$\frac{30 \text{ decrease}}{150 \text{ original}} = \frac{x}{100} \text{ percent?}$$

Be sure to use the ORIGINAL

$$\frac{30}{150} = \frac{x}{100}$$

20% decrease

$$3000 = 150x$$

$$20 = x$$

37. Subtract as indicated: 4 ft 2 in. - 1 ft 6 in.

$$\begin{array}{r} 4' 2'' \\ - 1' 6'' \\ \hline \end{array}$$

need to borrow  
1 foot or 12 inches

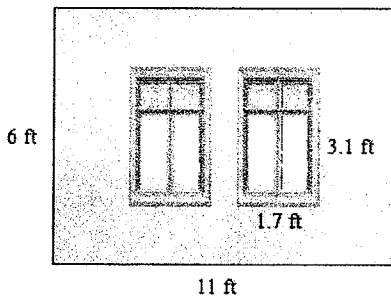
$$\begin{array}{r} 3' 14'' \\ - 1' 6'' \\ \hline 2' 8'' \end{array}$$

38. The measure of an angle is  $26.5^\circ$ . What is the measure of the angle's complement? What is the measure of the angle's supplement?

Complement  $90 - 26.5^\circ = 63.5^\circ$

Supplement  $180 - 26.5^\circ = 153.5^\circ$

39. Find the area of the background (pink-shaded) wall region. (The wall space minus the windows.)



wall area if no windows:  $6' \times 11' = 66 \text{ sq. ft.}$   
 one window:  $1.7' \times 3.1' = 5.27 \text{ sq. ft.}$   
 area of two windows =  $10.54 \text{ sq. ft.}$

wall space, background (minus windows):

$$\begin{array}{r} 66.00 \\ - 10.54 \\ \hline \end{array}$$

55.46 sq. ft.

40. A circle has a diameter of 42 cm. What is its area in terms of  $\pi$ ? What is its circumference in terms of  $\pi$ ?



radius = 21 cm  
diameter = 42 cm

Circumference =  $\pi d$

Area =  $\pi r^2$

$21 \cdot 21 =$

Circumference =  $42\pi \text{ cm}$

Area =  $\pi \cdot (21 \text{ cm})^2 = 441\pi \text{ cm}^2$

41. Consider the following ticket prices (in dollars) for 10 concerts held this school year.

13, 15, 15, 30, 15, 12, 30, 16, 23, 24

Find the MEAN price, the MEDIAN price, and the MODE price.

MEAN: add then divide by how many items  $193 \div 10$

MEAN = 19.3

MEDIAN: put in numerical order, find the center

12, 13, 15, 15, 15, 16, 23, 24, 30, 30

MEDIAN = 15.5

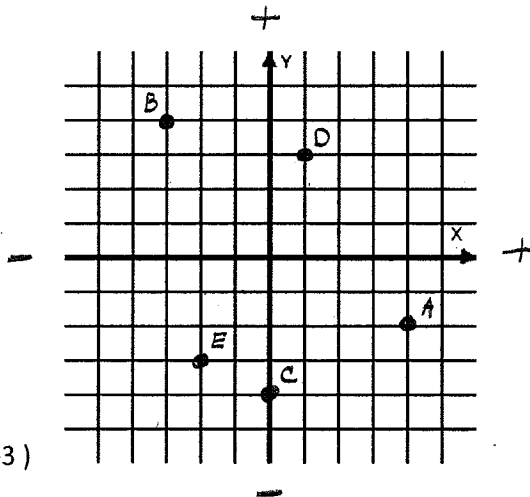
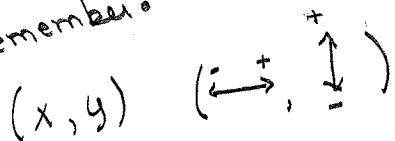
MODE: most often

$\frac{15+16}{2} = 15.5$

MODE = 15

42. Graph and label the points corresponding to:

Remember:



A (4, -2), B (-3, 4), C (0, -4), D (1, 3), E (-2, -3)

43. Complete the table of values that are solutions for the line:  $y = 2x - 4$

Give the x-intercept, the y-intercept, one additional point, and graph the line.

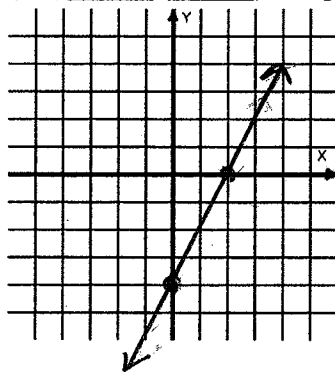
x-intercept ( 2 , 0 ) y-intercept ( 0 , -4 ) and graph the line.

x-intercept  
when y value is 0

$$\begin{array}{r} y = 2x - 4 \\ 0 = 2x - 4 \\ +4 \quad +4 \\ \hline 4 = 2x \\ \frac{4}{2} = \frac{2x}{2} \\ 2 = x \\ (2, 0) \end{array}$$

y-intercept  
when x value is 0

$$\begin{array}{r} y = 2x - 4 \\ y = 2(0) - 4 \\ y = -4 \\ (0, -4) \end{array}$$

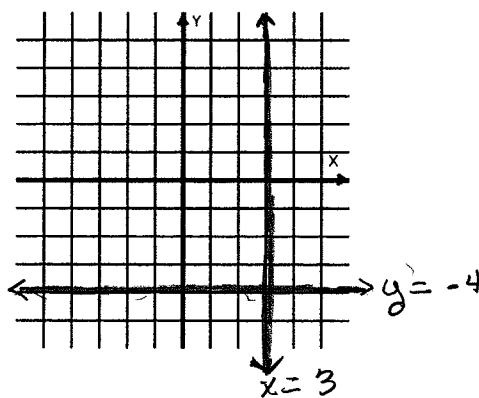




44. Graph the lines:  $x = 3$

The  $x$ -value is always 3.

and  $y = -4$  The  $y$ -value is always -4.



45. Perform the indicated operations.  $(-6xy^3)(10x^4y^3)$

$$(-6xy^3)(10x^4y^3)$$

$$\boxed{-60x^5y^6}$$

when multiplying matching bases, add exponents

and  $(-6abc)^2$

$$(-6abc)(-6abc)$$

$$\boxed{36a^2b^2c^2}$$

46. Perform the indicated operations:

$$(-x^3 - 4x^2 + 3x - 9) - (5x^2 - 21) - (-4x^3 + 3x + 9)$$

$$\begin{array}{r} -x^3 - 4x^2 + 3x - 9 \\ \quad - 5x^2 \quad + 21 \\ + 4x^3 \quad - 3x - 9 \\ \hline \end{array}$$

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

$$\boxed{3x^3 - 9x^2 + 3}$$

47. Find the products.

$$(5x + 4)(4x - 5)$$

FOIL

$$\boxed{(5x + 4)(4x - 5)}$$

$$20x^2 - 25x + 16x - 20$$

$$\boxed{20x^2 - 9x - 20}$$

$$(3x - 8)(3x + 8)$$

$$\boxed{(3x - 8)(3x + 8)}$$

$$9x^2 + 24x - 24x - 64$$

$$\boxed{9x^2 - 64}$$

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

Follow the grouping process!

48. Factor completely by grouping.

Factor out what is in common?

$$20x^2 - 25x + 16x - 20$$

$5x(4x - 5)$   
 $+ 4(4x - 5)$

copy ( ) here

Factor out what is in common

$$5x(4x - 5) + 4(4x - 5)$$

Factor out what is in common

$$(4x - 5)(5x + 4)$$

First remove GCF if present.

Form  $Ax^2 + Bx + C$

$$8n^2 - 14n + 3$$

Rewrite into 4 terms

ask: what two numbers ...

$$\underline{\quad} \cdot \underline{\quad} = 8 \cdot 3 = 24 \quad \text{the } A \cdot C$$

$$\underline{\quad} + \underline{\quad} = -14 \quad \text{the } B$$

two numbers that multiply to 24 and add to -14 are -12, -2

Rewrite, splitting center term:

$$8n^2 - 12n - 2n + 3$$

Factor by grouping.

$$4n(2n - 3) - 1(2n - 3)$$

$$(2n - 3)(4n - 1)$$

49. Factor completely.

$$4n^2 - 32n + 60$$

Remove GCF first:

$$4(n^2 - 8n + 15)$$

what two numbers  $\underline{\quad} \cdot \underline{\quad} = 15$

$$\underline{\quad} + \underline{\quad} = -8$$

$$-3, -5$$

since  $n^2$  is  $1n^2$ , can directly write factors or could factor by grouping:

$$4(n^2 - 3n - 5n + 15)$$

$$4(n(n-3) - 5(n-3))$$

$$4(n-3)(n-5)$$

$$4(n-3)(n-5)$$

50. Factor completely.

$$x^2 - 2x - 24$$

$$\underline{\quad} \cdot \underline{\quad} = -24$$

$$\underline{\quad} + \underline{\quad} = -2$$

$$-6, +4$$

$$(x-6)(x+4)$$

$$x^2 + 2x - 24$$

$$\underline{\quad} \cdot \underline{\quad} = -24$$

$$\underline{\quad} + \underline{\quad} = +2$$

$$6, -4$$

$$(x+6)(x-4)$$

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

$$\underline{\quad} \cdot \underline{\quad} = -24$$

$$\underline{\quad} + \underline{\quad} = -10$$

$$-12, +2$$

$$(x-12)(x+2)$$