Build and find the factors, then check by multiplying. Don't forget to check for a GCF. (You may not have enough blocks to build some of these.)

1. $2X^2 + 7X + 5$

2. $5X^2 + 17X + 6$

3. $2X^2 + 11X + 5$

4. $4X^2 + 13X + 3$

5. $2X^2 + 16X + 30$

6. $3X^2 + 9X + 6$

7. $2X^2 + 11X + 9$

8. $3X^2 + 23X + 14$

9. $2X^2 + 13X + 15$

10. $5X^2 + 50X + 105$

11. $6X^2 + 36X + 48$

12. $3X^2 + 14X + 16$

13. $4X^2 + 14X + 6$

14. $5X^2 + 7X + 2$

15. $10X^2 + 11X + 1$

16. $4X^2 + 23X + 15$

Build a rectangle and find the factors.

1. $3X^2 + 7X + 4 = ($ ___ $+$ ___ $)($ ___ $+$ ___ $)$

2. $2X^2 + 7X + 6 = ($ ___ $+$ ___ $)($ ___ $+$ ___ $)$

Build a rectangle and find the area (product).

3. $(2X + 2)(X + 3) =$

4. $(2X + 4)(X + 2) =$

5. Find the factors: $3X^2 + 13X + 12$.

6. Check #5 by multiplying the factors to find the product.

7. Find the factors: $4X^2 + 24X + 36$.

8. Check #7 by multiplying the factors to find the product.

9. Find the factors: $4X^2 + 8X + 3$.

10. Check #9 by multiplying the factors to find the product.

Simplify. Write your answer on one line unless otherwise instructed.

11. $B^2 \times B^6 \times B^{-5} =$

12. $A^B \cdot A^C =$

Hint for #13-14: first rewrite so that all the terms are in the numerator.
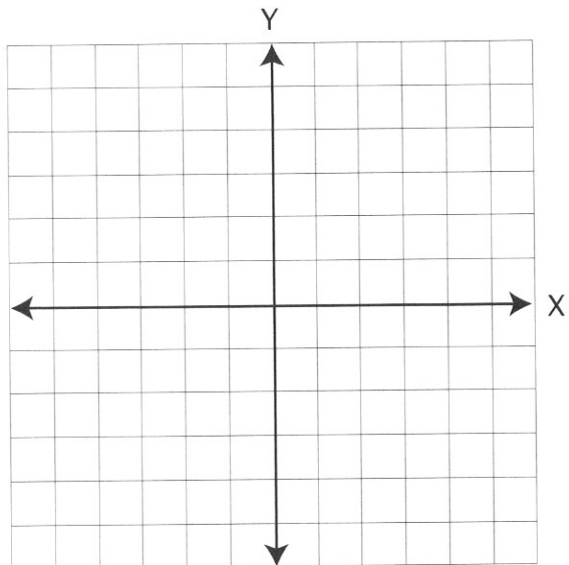
13. $\dfrac{X^{-3}Y^2X^{-1}}{Y^{-3}X^{-5}} =$

14. $\dfrac{A^3A^{-2}B^1}{B^{-2}A^4} =$

15. What number is this? $6 \times 10^6 + 8 \times 10^4 + 2 \times 10^3 + 7 \times 10^{-2}$

16. Rewrite in slope-intercept form and graph: $2Y = 3X - 2$.

17. What is the equation of a line parallel to #16 through (0,4)? Graph the line.

18. A scientist had one amoeba in a lab dish. The amoeba divided and doubled its numbers every hour. How many are there at the end of one hour?   two hours?   three hours?   four hours?

19. Rewrite each answer in #18 using 2 and an exponent. (At the end of the first hour, there would be 2^1 amoebas.) Look for the pattern.

20. Using exponents, write expressions telling how many amoebas there are after six hours and after X hours.

Build a rectangle and find the factors.

1. $3X^2 + 11X + 10 = ($ $+$ $)($ $+$ $)$

2. $4X^2 + 10X + 4 = ($ $)($ $+$ $)($ $+$ $)$

Build a rectangle and find the area (product).

3. $(3X + 3)(X + 2) =$

4. $(3X)(2X + 1) =$

5. Find the factors: $3X^2 + 8X + 5$.

6. Check #5 by multiplying the factors to find the product.

7. Find the factors: $4X^2 + 11X + 7$.

8. Check #7 by multiplying the factors to find the product.

9. Find the factors: $X^2 + 5X + 6$.

10. Check #9 by multiplying the factors to find the product.

Simplify each expression.

11. $C^{-4} \times C^3 \times C^0 =$
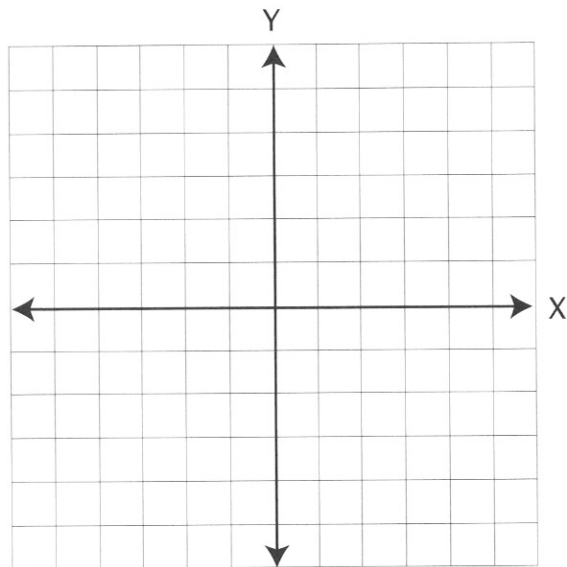
12. $8^5 \div 8^3 =$

Hint for #13–14: first rewrite so that all the terms are in the numerator.

13. $\dfrac{B^5 B^2 C^{-5}}{B^{-4} C^{-3}} =$

14. $\dfrac{D^6 C^{-4} D^2}{D^{-4} C^0 C^2} =$

15. Write this number with exponential notation: 86,900.4

16. Rewrite in slope–intercept form and graph: 3Y = 2X + 6.

17. What is the equation of a line parallel to #16 through (–3, –3)? Graph the line.

18. Dad agreed to triple Jason's allowance every week. For week one Jason received $3. How much did he get for week two? week three? week four? week five?

19. Rewrite each answer for #18 using 3 and an exponent. (For the first week, Jason would get 3^1 dollars.) Do you see a pattern?

20. Using exponents, write an expression telling how much Jason would be getting per week at the end of 20 weeks. If you have a calculator that will do exponents, use it to find how much money that would be.