# 9.4 Multi-Step Factoring

**ALGEBRA**

## STEPS FOR FACTORING

1.

2.

3.

| Factor out a number | Factor out a variable | Factor out both |
|---|---|---|
| $2x^2 + 12x + 16$ | $x^3 - 2x^2 - 8x$ | $3n^3 - 27n$ |

**FACTOR THE FOLLOWING.  CHECK YOUR ANSWER!**

$$6x^2 - 15x - 36$$

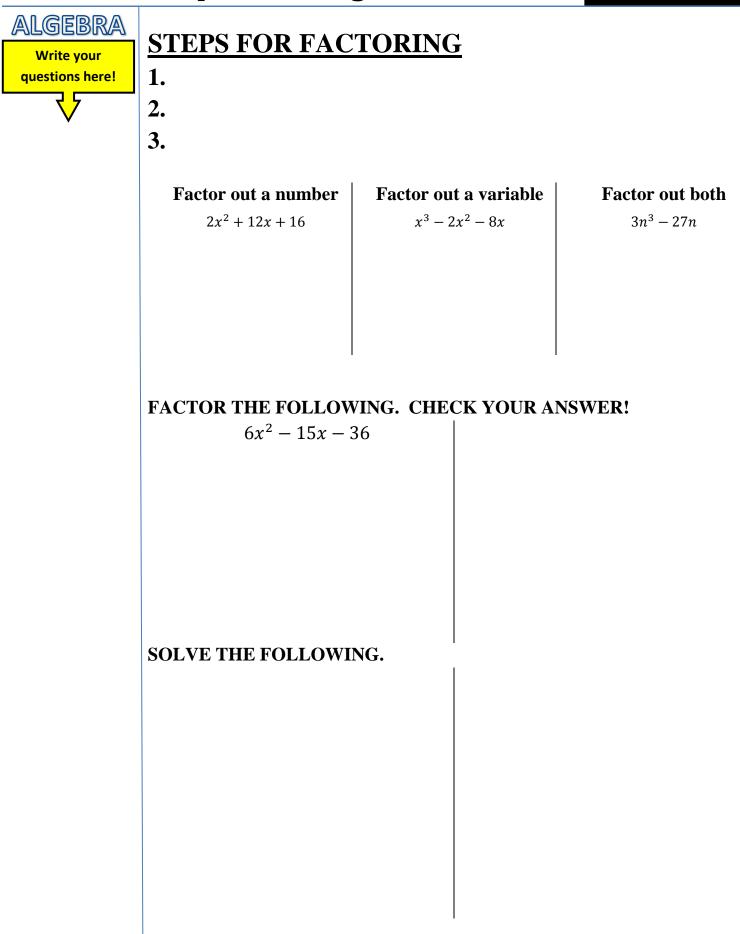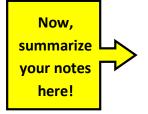**SOLVE THE FOLLOWING.**

**TRY IT!**

1. Factor $-2x^2 + 4x + 48$

2. Solve $5x^2 - 20 = 0$

3. Is $2(x-4)(3x+2)$ the factored form of $6x^2 - 20x - 16$ ?

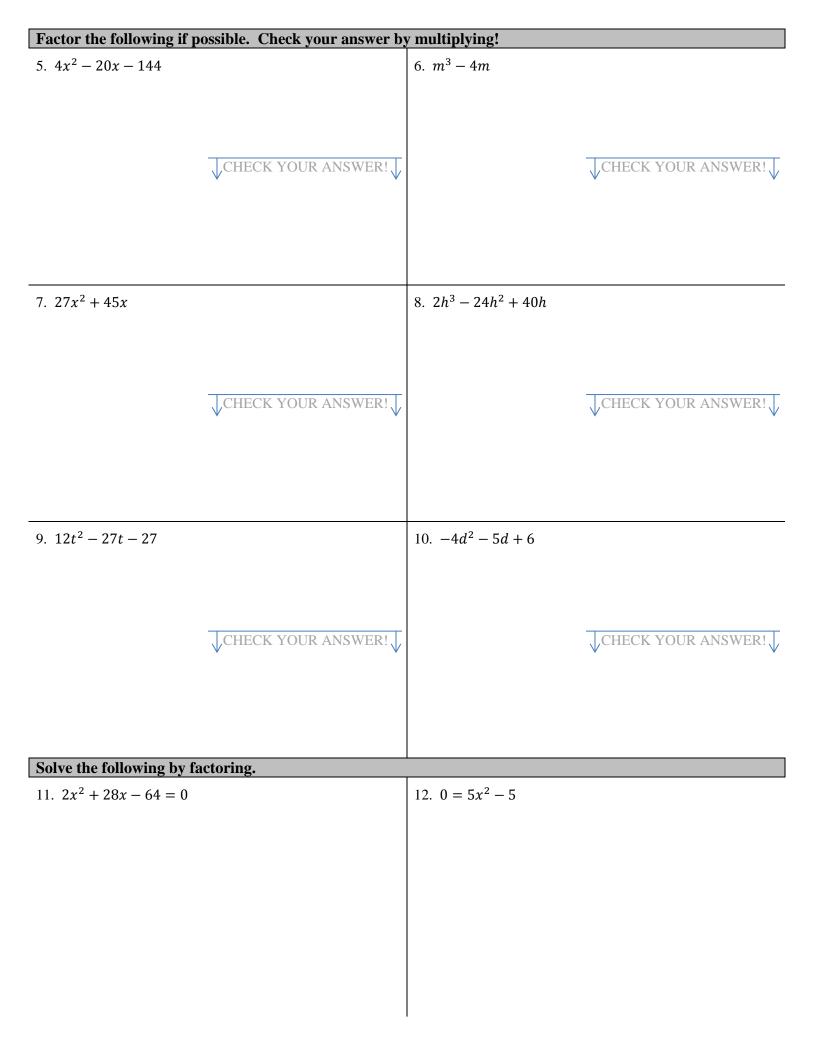## SUMMARY:

Now,
summarize
your notes
here!

## 9.4 Multi-Step Factoring

PRACTICE

| Check the work!  Multiply out the factored form to see if it matches the polynomial. | |
|---|---|
| 1. Is $2(x+6)(x-5)$ the factored form of $2x^2 + 2x - 60$ ? | 2. Is $3x(x+4)^2$ the factored form of $3x^3 + 48x$ ? |
| 3. Is $2d(d-7)(d-5)$ the factored form of $2d^3 - 12d^2 - 35d$ ? | 4. Is $4(t+3)(t-3)$ the factored form of $4t^2 - 36$ ? |

**Factor the following if possible.  Check your answer by multiplying!**

5. $4x^2 - 20x - 144$

6. $m^3 - 4m$

7. $27x^2 + 45x$

8. $2h^3 - 24h^2 + 40h$

9. $12t^2 - 27t - 27$

10. $-4d^2 - 5d + 6$

**Solve the following by factoring.**

11. $2x^2 + 28x - 64 = 0$

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

**Solve the following by factoring.**

13. $4x^3 - 12x^2 = -8x$

14. $-p^2 = 11p + 18$

15. $15n^2 + 41n - 18 = 2n$

16. $15x = 6x^3 - x^2$

**Answer the following.**

17. Simplify

$(5x^2 - 2x) + (x^2 - x + 5)$

18. Multiply $(2x - 1)^2$

19. Solve $4 - \frac{1}{2}x = 8$

20. Write the equation of the linear function for the situation below.

Bob has 26 dollars and makes 5 dollars every 2 hours.

21. Write the equation of the exponential function for the situation.

Bob has 26 dollars and triples his money every 2 weeks.

22. If $f(x) = 3x + 2$, find $-f(3) + 4$

1. Factor $2x^3 - 32x$

2. Solve $-2x^2 + 10x = -48$

3. Consider the function $f(x) = 2x^2 + 6x - 8$. What is the factored form of $f(x)$ ?

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

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

    (C) $f(x) = 2(x + 4)(x - 1)$

    (D) $f(x) = 2(x - 4)(x + 1)$

4. The equation $m(t) = 2t^3 - 21t^2 + 40t$ represents the money in Mr. Sully's bank account over time $t$, measured in days.

    a. Find $m(2)$. Use a sentence to explain its meaning in the context of this problem.

    b. When will Mr. Sully have no money?

**EXIT TICKET** –

The volume of the box shown below is $12x\ feet^3$. What are the dimensions of the box?



$(x + 4)$

$x$

$x$