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 $2x^2 + 2x - 60$?

$2(x^2 - 5x + 6x - 30)$

$2(x^2 + x - 30)$

$2x^2 + 2x - 60$ ✓

YES!

2. Is $3x(x+4)^2$ the factored form of $3x^3 + 48x$?

$3x(x+4)(x+4)$

$3x(x^2 + 4x + 4x + 16)$

$3x(x^2 + 8x + 16)$

$3x^3 + 24x^2 + 48x$ ✗

NO!

3. Is $2d(d-7)(d-5)$ the factored form of
$2d^3 - 12d^2 - 35d$?

$2d(d^2 - 5d - 7d + 35)$

$2d(d^2 - 12d + 35)$

$2d^3 - 24d^2 + 70d$ ✗

NO!

4. Is $4(t+3)(t-3)$ the factored form of $4t^2 - 36$?

$4(t^2 - 3t + 3t - 9)$

$4(t^2 - 9)$

$4t^2 - 36$ ✓

YES!

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

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

$4(x^2 - 5x - 36)$

$\boxed{4(x-9)(x+4)}$

-9×4
-36
-5

CHECK YOUR ANSWER!

$4(x-9)(x+4)$

$4(x^2 + 4x - 9x - 36)$

$4(x^2 - 5x - 36)$

$4x^2 - 20x - 144$ ✓

6. $m^3 - 4m$

$m(m^2 - 4)$

$\boxed{m(m+2)(m-2)}$

CHECK YOUR ANSWER!

$m(m+2)(m-2)$

$m(m^2 - 2m + 2m - 4)$

$m(m^2 - 4)$

$m^3 - 4m$ ✓

7. $27x^2 + 45x$

$\boxed{9x(3x+5)}$

CHECK YOUR ANSWER!

$9x(3x+5)$

$27x^2 + 5x$ ✓

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

$2h(h^2 - 12h + 20)$

$\boxed{2h(h-2)(h-10)}$

-2×-10
20
-12

CHECK YOUR ANSWER!

$2h(h-2)(h-10)$

$2h(h^2 - 10h - 2h + 20)$

$2h(h^2 - 12h + 20)$

$2h^3 - 24h^2 - 40h$ ✓

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

$3(4t^2 - 9t - 9)$

$3(4t^2 + 3t - 12t - 9)$

$3[t(4t+3) - 3(4t+3)]$

$\boxed{3(t-3)(4t+3)}$

3×-12
-36
-9

CHECK YOUR ANSWER!

$3(t-3)(4t+3)$

$3(4t^2 + 3t - 12t - 9)$

$3(4t^2 - 9t - 9)$

$12t^2 - 27t - 27$ ✓

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

$-(4d^2 + 5d - 6)$

$-[4d^2 + 8d - 3d - 6]$

$-[4d(d+2) - 3(d+2)]$

$\boxed{-(4d-3)(d+2)}$

8×-3
-24
5

CHECK YOUR ANSWER!

$-(4d-3)(d+2)$

$-(4d^2 + 8d - 3d - 6)$

$-(4d^2 + 5d - 6)$

$-4d^2 - 5d + 6$ ✓

Solve the following by factoring.

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

$2(x^2 + 14x - 32) = 0$

$2(x+16)(x-2) = 0$

$2=0 \mid x+16 = 0 \mid x-2=0$

$ x = -16 x = 2$

14 / 16 × -2 / -32

$\boxed{x = -16, 2}$

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

$0 = 5(x^2 - 1)$

$0 = 5(x+1)(x-1)$

$\mid x+1=0 \mid x-1=0$

$ x = -1 x = 1$

$\boxed{x = -1, 1}$

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

$+8x +8x$

$4x^3 - 12x^2 + 8x = 0$

$4x(x^2 - 3x + 2) = 0$

$4x(x-2)(x-1) = 0$

$4x=0 \mid x-2=0 \mid x-1=0$

$x=0 x=2 x=1$

-3 / -2 × -1 / 2

$\boxed{x = 0, 1, 2}$

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

$+p^2 +p^2$

$0 = p^2 + 11p + 18$

$0 = (p+2)(p+9)$

$p+2=0 \mid p+9=0$

$p = -2 p = -9$

11 / 2 × 9 / 18

$\boxed{p = -9, -2}$

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

$-2n -2n$

$15n^2 + 39n - 18 = 0$

$3(5n^2 + 13n - 6) = 0$

$3(5n^2 - 2n + 15n - 6) = 0$

$3(n(5n-2) + 3(5n-2)) = 0$

$3(n+3)(5n-2) = 0$

$\mid n+3 = 0 \mid 5n-2 = 0$

$n = -3 5n = 2$

13 / -2 × 15 / -30

$\boxed{n = -3, \frac{2}{5}}$

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

$-15x$

$0 = 6x^3 - x^2 - 15x$

$0 = x(6x^2 - x - 15)$

$0 = x[6x^2 - 10x + 9x - 15]$

$0 = x[2x(3x-5) + 3(3x-5)]$

$0 = x(2x+3)(3x-5)$

$x=0 \mid 2x+3=0 \mid 3x-5=0$

$ 2x = -3 3x = 5$

$ x = -\frac{3}{2} x = \frac{5}{3}$

-1 / -10 × 9 / -90

$\boxed{x = -\frac{3}{2}, 0, \frac{5}{3}}$

Answer the following.

17. Simplify

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

$5x^2 - 2x + x^2 - x + 5$

$\boxed{6x^2 - 3x + 5}$

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

$(2x-1)(2x-1)$

$4x^2 - 2x - 2x + 1$

$\boxed{4x^2 - 4x + 1}$

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

$-4 -4$

$(-\frac{2}{1}) - \frac{1}{2}x = 4 (-\frac{2}{1})$

$\boxed{x = -8}$

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

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

$f(x) = 26 + \frac{5}{2}x$

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

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

$f(x) = 26(3)^{\frac{x}{2}}$

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

$f(3) = 3(3) + 2$

$f(3) = 11$

$-11 + 4$

$\boxed{-7}$