



Factor Theorem 1 - SOLUTIONS



1. $(x + 2)(x - 3)$
2. $(x + 3)(x + 4)$
3. $x = 1, -3, 5$
4. $x = 2, -3, 4$
5. $x = -2, 4, -4$ (S*)
6. $x = -2, -3, 5$
7. $x = -\frac{2}{3}, 1, -1$ (S*)
8. $k = -2$ $(x - 1)(x + 2)$
9. $p = -11$ $(x + 4)(x - 3)$
10. $k = 2$ $(x + 1)(2x - 1)$ (S*)
11. $a = -2, b = -5$ $x = -2, 3, 1$
12. $p = -3, q = -10$ $x = -3, 4, 2$
13. $a = 2, b = 2$ $x = \frac{1}{2}, -3, -1$ (S*)



**Question 7**Try $x = 1$

$$3(1)^3 + 2(1)^2 - 3(1) - 2$$

$$\rightarrow 0 = 0$$

 $x = 1$ is a rootSo $(x - 1)$ is the factor

$$\begin{array}{r}
 + 5x + 2 \\
 x-1) + 2x^2 - 3x - 2 \\
 \underline{-3x^3 + 3x^2} \\
 5x^2 - 3x \\
 \underline{-5x^2 + 5x} \\
 2x - 2 \\
 \underline{-2x + 2} \\
 0
 \end{array}$$

$$3x^2 + 5x + 2 = 0$$

$$(3x + 2)(x + 1) = 0$$

$$x = -\frac{2}{3} \quad x = -1 \quad \text{and} \quad x = 1$$

Question 10 $(x + 3)$ is a factor so $x = -3$ is a root.

$$2(-3)^3 + 7(-3)^2 + k(-3) - 3 = 0$$

$$-54 + 63 - 3k - 3 = 0$$

$$-3k + 6 = 0$$

$$-3k = -6$$

$$k = 2$$

$$\begin{array}{r}
 2x^2 + x - 1 \\
 x+3) 2x^3 + 7x^2 + 2x - 3 \\
 \underline{-2x^3 - 6x^2} \\
 x^2 + 2x \\
 \underline{-x^2 - 3x} \\
 -x - 3 \\
 \underline{x + 3} \\
 0
 \end{array}$$

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

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



