

Factor. If it is not factorable, Write *prime*.

81. $x^2 - 7x + 10$

84. $a^2 + 4a - 45$

87. $y^2 - 13y + 40$

90. $x^2 - xy - 2y^2$

93. $x^2 + 2xy - 48y^2$

96. $5x^2 + 3x - 4$

99. $4x^3 + 4x^2 - 3x$

82. $x^2 + 3x - 10$

85. $p^2 - 5p + 6$

88. $x^2 + 39x - 40$

91. $a^2 - 2ab - 3b^2$

94. $4x^2 + 4x - 15$

97. $2a^4 - 5a^2 - 3$

100. $9y^3 + 39y^2 - 30y$

83. $x^2 + 3x + 10$

86. $p^2 - 5p - 6$

89. $-x^2 + 2x + 24$

92. $p^2 - 8pq - 20q^2$

95. $12x^2 - 13x + 3$

98. $4x^4 + 3x^2 - 10$

Factor by using special quadratic patterns.

101. $x^2 + 8x + 16$

104. $4y^2 - 9$

107. $9x^2 - 4y^2$

110. $4x^2 - 20xy + 25y^2$

113. $x^2 + 6x + 9 - 4y^2$

116. $a^6 - 10a^3 + 25$

119. $a^2(a+4) - 9(a+4)$

102. $4x^2 - 12x + 9$

105. $4a^2 - 4ab + b^2$

108. $4a^2b^2 - c^2$

111. $x^4 - 8x^2 + 16$

114. $a^2 - b^2 + 4b - 4$

117. $x^4 + 8x^2y + 16y^2$

120. $2x(x^2 - 4) + 3(4 - x^2)$

103. $a^2 - 18a + 81$

106. $16x^2 - 40xy + 25y^2$

109. $25p^2 - 20pq + 4q^2$

112. $16n^2 - 40n + 25$

115. $a^{4n} - 9$

118. $12x^3 - 27x$

Solve by factoring.

121. $(x+6)(x-12) = 0$

124. $x^2 - 5x - 14 = 0$

127. $5x^2 + 8x - 4 = 0$

130. $9a^2 - 16 = 0$

133. $(x+4)(x-6) = -9$

122. $(3x-6)(2x+1) = 0$

125. $a^2 + 10a + 21 = 0$

128. $x^2 - 14x + 49 = 0$

131. $x^3 - 3x^2 - 18x = 0$

134. $x(3x-1) = x+5$

123. $2n(n-4)(2n-5) = 0$

126. $2x^2 - 5x - 3 = 0$

129. $4x^2 + 12x + 9 = 0$

132. $2n^3 - 18n = 0$

135. $2x(x+2) = 3(3x-1)$

136. Find an equation in standard form that has the given roots (solutions) 1 and -3.
137. Find an equation in standard form that has the given roots (solutions) -2 and $\frac{2}{3}$.
138. If a number is subtracted from its square, the result is 132. Find the number.
139. Find two consecutive positive integers whose product is 182.
140. Find three consecutive positive integers such that the sum of the squares of the first two is 45 larger than the square of the third.
141. In a rectangle, the length is twice as long as the width. If its length and width are both increased by 4 cm, its area is increased by 100 cm². Find the original dimensions.
142. Find the dimensions of a rectangle having an area 105 cm² and whose length is 8 cm longer than its width?
143. A ball is thrown upward with an initial speed of 80 feet per second. The height (*h*) of the ball is given by the formula $h = vt - 16t^2$, where *v* is the initial speed and *t* is the time in seconds. How many seconds will it take to reach the ground again?
144. In question 143, what will be the maximum height the rocket reaches?