

Substitution

Ex: 11.5

Evaluate the following expressions

if $P=4$, $q=-2$, $r=3$ and $s=-5$.

$$\begin{aligned}
 1. a \quad 2p + 4q &= 2 \times 4 + 4 \times (-2) \\
 &= 8 - 8 \\
 &= \underline{\underline{0}}
 \end{aligned}$$

$$\begin{aligned}
 d. \quad 6p - 8q + 4s &= 6 \times 4 - 8 \times (-2) + 4 \times (-5) \\
 &= 24 + 16 - 20 \\
 &= \underline{\underline{20}}
 \end{aligned}$$

$$\begin{aligned}
 f \quad -p - q + r + s &= -4 - (-2) + 3 + (-5) \\
 &= -4 + 2 + 3 - 5 \\
 &= \underline{\underline{-4}}
 \end{aligned}$$

$$\begin{aligned}
 2 a \quad 2p - 3q - 4r + s &= 2 \times 4 - 3 \times (-2) - 4 \times 3 - 5 \\
 &= 8 + 6 - 12 - 5 \\
 &= \underline{\underline{-3}}
 \end{aligned}$$

$$\begin{aligned}
 c. \quad p^2 + q^2 &= 4^2 + (-2)^2 \\
 &= 16 + 4 \\
 &= \underline{\underline{20}}
 \end{aligned}$$

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| $ \begin{aligned} -2^2 &= -4 \\ (-2)^2 &= -2 \times -2 \\ &= 4 \end{aligned} $ |
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$$\begin{aligned}
 e. \quad p(q-r+s) &= 4(-2) - 3 + (-5) \\
 &= 4(-2-3-5) \\
 &= \underline{\underline{-40}}
 \end{aligned}$$

$$\begin{aligned}
 3.a) \quad 2s(3p-2q) &= 2 \times (-5)(3 \times 4 - 2 \times (-2)) \\
 &= -10(12+4) \\
 &= \underline{\underline{-160}}
 \end{aligned}$$

$$\begin{aligned}
 d. \quad q^3 - r^2 &= (-2)^3 - 3^2 \\
 &= -8 - 9 \\
 &= \underline{\underline{-17}}
 \end{aligned}$$

$$\begin{aligned}
 f. \quad r^4 - q^5 &= 3^4 - (-2)^5 \\
 &= 81 - (-32) \\
 &= 81 + 32 \\
 &= \underline{\underline{113}}
 \end{aligned}$$

$$\begin{aligned}
 4a. \quad -2pqr &= -2 \times 4 \times (-2) \times 3 \\
 &= \underline{\underline{48}}
 \end{aligned}$$

$$\begin{aligned}
 b. \quad -2p(q+r) &= -2 \times 4((-2)+3) \\
 &= -8 \times (1) \\
 &= \underline{\underline{-8}}
 \end{aligned}$$

$$\begin{aligned}
 f. \quad (r+q)(p-s) &= (3+(-2))(4-(-5)) \\
 &= 1 \times 9 = 9 \\
 &= \underline{\underline{9}}
 \end{aligned}$$

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$$\begin{aligned} 5a) (2p+3q)(p-q) &= (2 \times 4 + 3 \times (-2))(4 - (-2)) \\ &= (8 - 6)(4 + 2) \\ &= 2 \times 6 \\ &= \underline{\underline{12}} \end{aligned}$$

$$\begin{aligned} e) (p+r)(p-r) &= (4+3)(4-3) \\ &= 7 \times 1 \\ &= \underline{\underline{7}} \end{aligned}$$

$$\begin{aligned} \frac{1}{b} (-5+p)q^2 &= (-(-5)+4) \times (-2)^2 \\ &= (5+4) \times 4 \\ &= 9 \times 4 \\ &= \underline{\underline{36}} \end{aligned}$$

Hw. 1b

2. d

3. c

4. c

5. d.