Factorial Notation Total points = 47

1. (7)(6)(5)(4)(3)(2)(1)**=**|5,040 | **√** 2. (3)(2)(1) + (5)(4)(3)(2)(1)

$$= 6 + 120 \checkmark$$

$$= \boxed{126} \checkmark$$

3.
$$(8)(7)(6)(5)(4)(3)(2)(1) - (6)(5)(4)(3)(2)(1) \checkmark$$

= $40,320 - 720 \checkmark$
= $\boxed{39,600} \checkmark$

(9)(8)(7)(6)(5)(4)(3)(2)(1) –
(3)(2)(1)
$$\checkmark$$

= 362,880 – 6 \checkmark
= 362,874 \checkmark

5.
$$\frac{(8)(7)(6)(5)(4)(3)(2)(1)}{(5)(4)(3)(2)(1)(4)(3)(2)(1)}$$

$$=\frac{40,320}{2,880}$$

$$=\boxed{14}$$

1.
$$\frac{(6)(5!) - 5!}{5} \checkmark$$

$$= \frac{5!(6-1)}{5} \checkmark$$

$$= \frac{5!(5)}{5} \checkmark$$

$$= 5! \checkmark$$

$$\begin{array}{l}
= \boxed{120} \checkmark \\
2. \frac{(8)(7!) - 7!}{7!} \checkmark \\
= \frac{7!(8 - 1)}{7!} \checkmark \\
= \boxed{7} \checkmark
\end{array}$$

3.
$$\frac{(7)(6)(5!)+5!}{60}$$

$$= \frac{5!(42+1)}{60} \checkmark$$

$$= \frac{120(43)}{60} \checkmark$$

$$= 2(43) \checkmark$$

$$= 86 \checkmark$$

$$\frac{(9)(8)(7)(6)(5!) - 5!}{24} \checkmark$$

$$= \frac{5!(3,024 - 1)}{24} \checkmark$$

$$= \frac{120(3,023)}{24} \checkmark$$

$$= 5(3,023) \checkmark$$

$$= 15,115 \checkmark$$

5. =
$$\frac{(6)(5)(4!) + (5)(4!) - 4!}{4!}$$

= $\frac{(4!(30+5-1))}{4!}$ \checkmark
= $\boxed{34}$ \checkmark

1.
$$\frac{(n)(n-1)!}{(n-1)!} \checkmark$$

$$= \boxed{n} \checkmark$$
2.
$$\frac{(n-1)!}{(n)(n-1)!} \checkmark$$

$$= \boxed{\frac{1}{n}} \checkmark$$

3.
$$\frac{(n+2)(n+1)!}{(n+1)!} \checkmark$$
$$= (n+2) \checkmark$$

4.
$$\frac{(n-1)!}{(n+1)(n)(n-1)!} \checkmark$$
$$= \boxed{\frac{1}{(n+1)(n)}} \checkmark$$

$$\frac{(n+1)(n)(n-1)! - (n)(n-1)! + (n-1)!}{(n-1)!} \checkmark$$

$$= \frac{(n-1)![(n+1)(n) - n + 1]}{(n-1)!} \checkmark$$

$$= \frac{n^2 + n - n + 1}{(n^2 + 1)} \checkmark$$

Factorial Notation Total points = 47

1.
$$(7)(6)(5)(4)(3)(2)(1)$$
 \checkmark
= $\begin{bmatrix} 5,040 \end{bmatrix}$ \checkmark
2. $(3)(2)(1) + (5)(4)(3)(2)(1)$

$$= 6 + 120 \checkmark$$

$$= 126 \checkmark$$
3. (8)(7)(6)(5)(4)(3)(2)

3.
$$(8)(7)(6)(5)(4)(3)(2)(1) -$$

 $(6)(5)(4)(3)(2)(1) \checkmark$
 $= 40,320 - 720 \checkmark$
 $= \boxed{39,600} \checkmark$

1.
$$(9)(8)(7)(6)(5)(4)(3)(2)(1) - (3)(2)(1) \checkmark = 362,880 - 6 \checkmark = 362,874 \checkmark$$

5.
$$\frac{(8)(7)(6)(5)(4)(3)(2)(1)}{(5)(4)(3)(2)(1)(4)(3)(2)(1)}$$
$$= \frac{40,320}{2,880} \checkmark$$

$$= \frac{40,320}{2,880} \checkmark$$

$$= \boxed{14} \checkmark$$
3.
1.
$$\frac{(6)(5!) - 5!}{2} \checkmark$$

$$\frac{(6)(5!) - 5!}{5} \checkmark$$

$$= \frac{5!(6-1)}{5} \checkmark$$

$$= \frac{5!(5)}{5} \checkmark$$

$$= 5! \checkmark$$

$$= 120 \checkmark$$

2.
$$\frac{(8)(7!) - 7!}{7!} = \frac{7!(8-1)}{7!} \checkmark$$

3.
$$\frac{(7)(6)(5!) + 5!}{60}$$

$$= \frac{120(43)}{60} \checkmark$$

$$= 2(43) \checkmark$$

$$= 86 \checkmark$$

$$(9)(8)(7)(6)(5!) - 5!$$

$$= \frac{5!(3,024 - 1)}{24} \checkmark$$

5!(42+1)

$$= \frac{24}{120(3,023)} \checkmark$$

$$= \frac{120(3,023)}{24} \checkmark$$

$$= \frac{5(3,023)}{15,115} \checkmark$$

$$= \frac{(6)(5)(4!) + (5)(4!) - 4!}{15}$$

1.
$$\frac{(n)(n-1)!}{(n-1)!} \checkmark$$

=\frac{n}{n} \ldot
2. $\frac{(n-1)!}{(n)(n-1)!} \checkmark$

$$\frac{(n-1)!}{(n)(n-1)!} \checkmark$$

$$= \frac{1}{n} \checkmark$$

$$\frac{(n+2)(n+1)!}{(n+1)!} \checkmark$$

$$= (n+2) \checkmark$$
4.
$$\frac{(n-1)!}{(n+1)(n)(n-1)!} \checkmark$$

$$= \frac{1}{(n+1)(n)} \checkmark$$

5!(42+1)60 120(43)

$$\frac{(n+1)(n)(n-1)! - (n)(n-1)! + (n-1)!}{(n-1)!} = \frac{(n-1)![(n+1)(n)-n+1]}{(n-1)!} \checkmark$$

$$= \frac{n^2 + n - n + 1}{(n^2 + 1)} \checkmark$$

Factorial Notation

Total points = 47

(7)(6)(5)(4)(3)(2)(1)5,040

$$= 6 + 120 \checkmark$$

$$= 126 \checkmark$$
3. (8)(7)(6)(5)(4)(3)(2)(1) -

$$\begin{array}{c} 3. & (6)(7)(6)(3)(4)(3)(2)(1) \\ & (6)(5)(4)(3)(2)(1) \checkmark \\ & = 40,320 - 720 \checkmark \\ & = \boxed{39,600} \checkmark \end{array}$$

$$(9)(8)(7)(6)(5)(4)(3)(2)(1) - (3)(2)(1) \checkmark$$

$$= 362,880 - 6 \checkmark$$

$$= 362,874 \checkmark$$

5.
$$\frac{(8)(7)(6)(5)(4)(3)(2)(1)}{(5)(4)(3)(2)(1)(4)(3)(2)(1)}$$

$$= \frac{40,320}{2,880} \checkmark$$

$$= \boxed{14} \checkmark$$

3.
1.
$$\frac{(6)(5!) - 5!}{5} \checkmark$$

$$= \frac{5!(6-1)}{5} \checkmark$$

$$= \frac{5!(5)}{5} \checkmark$$

$$= 5! \checkmark$$

$$\begin{array}{l}
= \boxed{120} \checkmark \\
2. \frac{(8)(7!) - 7!}{7!} \checkmark \\
= \frac{7!(8 - 1)}{7!} \checkmark
\end{array}$$

$$= \boxed{7} \checkmark$$
3.
$$\frac{(7)(6)(5!) + 5!}{60}$$

$$= \frac{5!(42+1)}{60} \checkmark$$

$$= \frac{120(43)}{60} \checkmark$$

$$= 2(43) \checkmark$$

$$= 86 \checkmark$$

$$=\frac{(9)(8)(7)(6)(5!)-5!}{24}$$

$$=\frac{5!(3,024-1)}{120(3,023)}$$

5. =
$$\frac{(6)(5)(4!) + (5)(4!) - 4!}{4!}$$

$$(4!(30+5-1))$$

$$= \boxed{34} \checkmark$$

$$1. \frac{(n)(n-1)!}{(n-1)!} \checkmark$$

$$2. \frac{(n-1)!}{(n)(n-1)!}$$

$$= \frac{1}{n} \checkmark$$
3.
$$\frac{(n+2)(n+1)!}{(n+1)!} \checkmark$$

$$= (n+2) \checkmark$$

4.
$$\frac{(n-1)!}{(n+1)(n)(n-1)!} \checkmark$$

$$= \frac{1}{(n+1)(n)} \checkmark$$

5.
$$\frac{(n+1)(n)(n-1)! - (n)(n-1)! + (n-1)!}{(n-1)!} \checkmark$$

$$= \frac{(n-1)![(n+1)(n)-n+1]}{(n-1)!} \checkmark$$

$$= \frac{n^2 + n - n + 1}{(n^2 + 1)} \checkmark$$

Factorial Notation Total points = 47

A.
1.
$$(7)(6)(5)(4)(3)(2)(1) \checkmark$$

= $5,040$ \checkmark
2. $(3)(2)(1) + (5)(4)(3)(2)(1)$
 \checkmark
= $6 + 120$ \checkmark

$$= \boxed{126} \checkmark$$
3. (8)(7)(6)(5)(4)(3)(2)(1) - (6)(5)(4)(3)(2)(1) \checkmark = 40,320 - 720 \checkmark = \boxed{39,600} \checkmark

4.
(9)(8)(7)(6)(5)(4)(3)(2)(1)
(3)(2)(1)
$$\checkmark$$

= 362,880 - 6 \checkmark
= 362,874 \checkmark

3.

1.
$$\frac{(6)(5!) - 5!}{5} \checkmark$$

$$= \frac{5!(6 - 1)}{5} \checkmark$$

$$= \frac{5!(5)}{5} \checkmark$$

$$= 5! \checkmark$$

$$= [120] \checkmark$$
2.
$$\frac{(8)(7!) - 7!}{5} \checkmark$$

7!

60

$$\begin{array}{c}
7! \\
= \frac{7!(8-1)}{7!} \checkmark \\
= \boxed{7} \checkmark \\
3. \frac{(7)(6)(5!) + 5!}{(7!)}
\end{array}$$

$$\begin{array}{c}
-\frac{60}{60} \\
= 2(43) \checkmark \\
= 86 \checkmark \end{aligned}
4. \frac{(9)(8)(7)(6)(5!) - 5!}{24} \checkmark \\
= \frac{5!(3,024 - 1)}{24} \checkmark \\
= \frac{120(3,023)}{24} \checkmark \\
= 5(3,023) \checkmark \\
= 15,115 \checkmark \end{aligned}
5. = \frac{(6)(5)(4!) + (5)(4!) - 4!}{4!} \checkmark \\
= \frac{(4!(30 + 5 - 1))}{4!} \checkmark \\
= \frac{34}{4!} \checkmark$$
1.
$$\begin{array}{c}
(n)(n - 1)! \\
= n \checkmark \\
2. \frac{(n - 1)!}{(n)(n - 1)!} \checkmark \\
= \frac{1}{4!} \checkmark \end{aligned}$$

2.
$$\frac{(n)(n-1)!}{=\frac{1}{n}} \checkmark$$

$$=\frac{1}{n} \checkmark$$
3. $\frac{(n+2)(n+1)!}{(n+1)!} \checkmark$

$$=\frac{(n+2)}{(n+2)!} \checkmark$$
4. $\frac{(n-1)!}{(n+1)(n)(n-1)!} \checkmark$

$$=\frac{1}{(n+1)(n)} \checkmark$$
5. $\frac{(n+1)(n)(n-1)!-(n)(n-1)!+(n-1)!}{(n+1)(n-1)!} \checkmark$

5.
$$\frac{(n+1)(n)}{(n-1)! - (n)(n-1)! + (n-1)!} \checkmark$$

$$= \frac{(n-1)![(n+1)(n) - n + 1]}{(n-1)!} \checkmark$$

$$= \frac{n^2 + n - n + 1}{n^2 + 1} \checkmark$$