

$$\lim_{x \rightarrow 1} \frac{14x^2 - \sqrt{2x+3}}{52x^2 - 18x + 3} \Rightarrow \frac{(2x-1)(14x-3)}{(2x-1)(52x-3)} = \frac{14x-3}{52x-3} = \frac{1}{2} \checkmark$$

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$$x \rightarrow 0 \Rightarrow 3x-1 < 0 \Rightarrow \frac{-(3x-1)-3x-1}{2x} = \frac{-4x}{2x} = -2 \checkmark$$

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$$\lim_{x \rightarrow 4} \frac{x-4}{\sqrt{x}-2} \Rightarrow \frac{(\sqrt{x}-2)(\sqrt{x}+2)}{(\sqrt{x}-2)} = \sqrt{x}+2 = 4 \checkmark$$

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$$\lim_{x \rightarrow 2} \frac{x - \sqrt{2x}}{(x-2)(2x+3)} \rightarrow \times \frac{\cancel{2x}}{\cancel{2x}} \rightarrow \frac{x^2 - 2x}{(x-2)(2x+3)} \times \frac{1}{2}$$

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$$\rightarrow \frac{x(x-2)}{2(x-2)(2x+3)} = \frac{2}{2 \cdot 7} = \frac{1}{7} \checkmark$$

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$$\lim_{x \rightarrow 1} \frac{1 - \sqrt{x}}{2 - \sqrt{5-x}} \rightarrow \times \frac{\cancel{2x}}{\cancel{2x}} \times \frac{\cancel{2x}}{\cancel{2x}} \rightarrow \frac{1-x}{2-\sqrt{5-x}} \times \frac{1}{2} \times 2 = -1 \checkmark$$

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$$\lim_{x \rightarrow k} \frac{\sqrt{px+k} - k}{\sqrt{qx+v} - p} \rightarrow x \frac{0}{0} \times \frac{f'}{g'} \rightarrow \frac{px - k}{qx - p} \times \frac{p}{q} = \frac{p}{q} \times \frac{p}{q} = \frac{p^2}{q^2}$$

$\frac{p}{q}$ ✓

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$$\lim_{x \rightarrow 1} \frac{\sqrt{px+\sqrt{x}} - k}{\sqrt{x} - 1} \rightarrow x \frac{0}{0} \times \frac{f'}{g'} \rightarrow \frac{px + \sqrt{x} + k}{x - 1} \times \frac{p}{k}$$

$$\rightarrow \left(\frac{px - p}{x - 1} + \frac{(\sqrt{x} - 1)}{(\sqrt{x} - 1)(\sqrt{x} + 1)} \right) \times \frac{p}{k} = \frac{p}{k} \times \frac{p}{k} = \frac{p^2}{k^2}$$

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$$\rightarrow \frac{\cos^2 x + \sin^2 x + \cos^2 x}{\sin^2 x} \Rightarrow \frac{\cos^2 x (1 + \cos^2 x)}{1 - \cos^2 x} + \frac{\sin^2 x}{\sin^2 x}$$

$$\rightarrow \frac{\cos^2 x}{1 - \cos^2 x} + 1 \rightarrow \frac{(-1)^2}{1 - 1} + 1 = \frac{p}{k}$$

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$$\frac{1 - \tan^2 x}{\sin x - \cos x} \times \frac{0}{0} \times \frac{f'}{g'} = \frac{1 - \tan^2 x}{\sin x - \cos x} \times \frac{p}{\sqrt{p}}$$

$$\rightarrow \frac{p(1 - \tan^2 x)}{-\sqrt{p}(\cos x)} = \frac{p(1 - \tan^2 x)}{\sqrt{p}(1 - \tan^2 x)} = \frac{-p(1 + \tan^2 x)}{\sqrt{p}} = \frac{-p}{\sqrt{p}} \rightarrow -\sqrt{p}$$

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$$\tan^2 x = \frac{1 - \cos 2x}{1 + \cos 2x} \Rightarrow \frac{1 - \cos 2x - 1}{1 + \cos 2x} = \frac{-\cos 2x}{1 + \cos 2x}$$

$$\rightarrow \cos 2x = z \Rightarrow \frac{-pz}{1+z} = \frac{-pz}{z(z+1)} = \frac{-p}{z+1} \rightarrow \frac{-p}{0+1} = -p$$

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