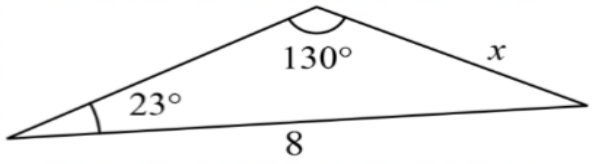
Qns 12(2023) Rev 2 Thur 27/10

Fully simplify $\dfrac{x^2-4}{2x^2+3x-2}$ 2

Find the value of x correct to 1 decimal place 1



AstraZeneca and Pfizer are currently the two Covid-19 Vaccines available in Australia. 50 unvaccinated Newtown residents were asked about their willingness to be vaccinated by either vaccine over the next 3 months.

- 26 residents said they were willing to be vaccinated by the Pfizer vaccine
- 22 residents said they were willing to be vaccinated by the AstraZeneca vaccine
- 12 residents said they were NOT willing to be vaccinated

(a) A random resident from the group was selected. By using a Venn diagram or otherwise, find the probability that they were willing to be vaccinated by either vaccine 2

(b) Two residents were selected (without replacement). What is the probability that at least one of them was willing to be vaccinated ? 1

Atticus owns a biased six-sided die which has the following discrete probability distribution

x	1	2	3	4	5	6
$P(X = x)$	0.25	0.25	0.2	0.1	0.1	0.1

(a) Find $P(3 < X \leq 6)$ 1

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(b) Show that the expected value $E(X) = 2.85$ 1

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(c) At a school fund raiser, Atticus uses his biased die to run a game, where students pay \$3.50 per game to roll the biased die and in turn win \$1 multiplied by the number that they have rolled 2

How much profit or loss would Atticus expect to make for 200 games?

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Differentiate $y = xe^{2x}$ 1

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The temperature of a freshly served bowl of phở bò from Tan Viet Noodle House is given by the following equation:

$$T = 22 + 60e^{-0.1t}$$

Where T is the temperature in degrees Celsius

And t is the time in minutes.

(a) To the nearest degree, what is the temperature of the phở after 1 minute ? 1

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(b) How long will it take for the temperature of the phở to drop to 62° 2

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