

Exercise 17.17

Question

17.17. *Marian Haste, Again*

- (a) See Problem 16.11. What is the maximum Marian should pay for better information about the weather?
 (b) See Problem 15.8. What is May's advice worth to Marian?

16.11 *Marian Haste*

Marian Haste is a painter under contract to paint the exterior of a building for \$225,000. Unfortunately for her, the outside temperature may drop below freezing. If it does, the paint will not stick well and may peel off. The paint may also peel off even if it does not freeze. Either way, Marian would have to repaint the building, at a cost of \$150,000.

The radio forecasts a 60% chance of freezing. Marian also believes there is a $\frac{1}{3}$ chance the paint may peel if it freezes, but a 10% chance if it does not. Her choices now are to go ahead and paint, or to defer until there is no chance of frost. Deferring the job would require her to pay \$30,000 in overtime and penalties. What would you advise Marian Haste to do? (For your own amusement, the question is should Marian Haste go ahead, and repaint at leisure?)

15.8. *Weather Expert*

The radio predicts a 60% chance of freezing weather. Your meteorological friend, May Vin, tells you she knows better: it is sure to freeze. From experience you know that she only gets it right 80% of the time.

- (a) What should your estimate of freezing weather be?
 (b) What would it be if May had predicted "no freezing weather"?

Solution from Manual

17.17 Marian Haste, Part II

a) The perfect test would lead to:

No Frost P = 0.4	Go Ahead	No Peel	0
		Repaint P = 0.1	- 150
Frost P = 0.6	Defer		- 45

EVPI = $[0.4 (0.1(-150)) + 0.6(-45)] - (-36) = -6 - 27 + 36 = 3$
 As a practical matter, rule of thumb says pay no more than EVPI/2.

b) See Figure S17.21.

$$P(\text{Repaint/says NF}) = P(\text{NF/says NF}) (0.1) + P(\text{F/says NF}) (1/3)$$

$$= (8/11) (0.1) + (3/11) (1/3) = 18/110 \sim 0.163$$

$$P(\text{Repaint/says F}) = P(\text{NF/says F}) (0.1) + P(\text{Frost/says F}) (1/3)$$

$$= (1/7) (0.1) + (6/7) (1/3) = 0.3$$

If says Frost: $EV(\text{Go Ahead}) = -270/11 > -45 = EV(\text{Defer})$
 If says No Frost: $EV(\text{Go Ahead}) = -51.8 < -45 = EV(\text{Defer})$
 EVSI = $[0.44 (-270/11) + 0.56 (-45)] - (-36) = 0 !!!$